

ORIGINAL



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BEFORE THE ARIZONA CORPORATION COMMISSION

2009 NOV 23 P 1:30

COMMISSIONERS

Kristin K. Mayes – Chairman  
Gary Pierce  
Paul Newman  
Sandra D. Kennedy  
Bob Stump

AZ CORP COMMISSION  
DOCKET CONTROL

IN THE MATTER OF THE JOINT  
APPLICATION OF: (1) FRANCISCO  
GRANDE UTILITY COMPANY, AN  
ARIZONA CORPORATION, TO  
TRANSFER A PORTION OF ITS EXISTING  
CERTIFICATE OF CONVENIENCE AND  
NECESSITY TO ARIZONA WATER  
COMPANY, AN ARIZONA  
CORPORATION; AND (2) ARIZONA  
WATER COMPANY, AN ARIZONA  
CORPORATION, TO INCLUDE  
CERTIFICATED AREA TO BE  
TRANSFERRED BY FRANCISCO GRANDE  
UTILITY COMPANY IN ARIZONA  
WATER COMPANY'S CASA GRANDE  
CERTIFICATE OF CONVENIENCE AND  
NECESSITY

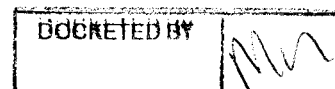
DOCKET NO. W-01445A-05-0700  
DOCKET NO. W-01775A-05-0700

**REQUEST FOR:**

- (A) DETERMINATION OF COMPLIANCE  
WITH DECISION AND ORDER; OR  
(B) IN THE ALTERNATIVE, FOR  
ADDITIONAL TIME FOR COMPLIANCE  
FILING

Arizona Corporation Commission  
**DOCKETED**

NOV 23 2009



On August 6, 2008, the Commission entered Decision No. 70450 in the above-captioned docket extending Arizona Water Company's (the "Company") time to comply with certain conditions included in Decision No. 68654 (the "Decision") to April 12, 2010. The Decision approved the Company's application for an extension of its certificate of convenience and necessity for its Casa Grande system. It also contained the following ordering paragraphs, at page 8, lines 1-16 of the Decision:

IT IS FURTHER ORDERED that the Company shall file with Docket Control, as a compliance item in this docket, copies of the Arizona Department of Environmental Quality's Approval to Construct ("Approval to Construct") for

1 facilities needed to serve the requested transfer areas within two years of the  
2 effective date of the Decision in this Order.

3 IT IS FURTHER ORDERED that Arizona Water Company shall file with  
4 Docket Control, as a compliance item in this docket, a Notice of filing indicating  
5 Arizona Water Company has submitted for Staff's review and approval, a copy of  
6 the fully executed main extension agreements for water facilities for the requested  
7 transfer areas within two years of the effective date of the Decision.

8  
9 IT IS FURTHER ORDERED that Arizona Water Company shall file with  
10 Docket Control, as a compliance item in this docket, a copy of the developers'  
11 Certificate of Assured Water Supply for the requested transfer areas where  
12 applicable or when required by statute, within two years of the effective date of  
13 the Decision in this Order.

14  
15 The Company is requesting that the current compliance deadline, April 12, 2010, be  
16 extended for an additional two (2) year period, until April 12, 2012. In support of its request, the  
17 Company respectfully submits and provides as follows:

18  
19 1. In compliance with the requirement that a copy of an Approval to Construct be  
20 filed, as detailed above, the Company is filing with this Request (see Attachment 1, hereto), an  
21 Approval to Construct water facilities needed to serve the requested transfer area.

22  
23 2. In compliance with the requirement of a notice of filing indicating that the  
24 Company has submitted for Staff's review and approval a copy of a fully executed main  
25 extension agreement for water facilities for the requested transfer area, the Company is filing  
26 with this request (see Attachment 2, hereto) a copy of a transmittal letter to the Director of the  
27 Utilities Division, dated September 9, 2009 (and currently pending approval by Staff) that  
28

1 enclosed for Staff's review and approval (also part of Attachment 2, hereto) a fully executed  
2 main extension agreement for water facilities for the requested transfer area.

3  
4 3. In mid to late 2006, the housing market in Arizona began its current decline.

5  
6 4. Before a developer can plat any subdivision within an Active Management Area,  
7 the Arizona Department of Water Resources ("ADWR") must have issued a CAWS.

8  
9 5. The ADWR requires proof of water supplies physically available to serve a  
10 planned subdivision for a minimum of one hundred years and will not issue a CAWS without  
11 such proof.

12  
13 6. The Company contracted with Clear Creek Associates, a highly respected  
14 professional hydrologic engineering firm to prepare a regional groundwater model for the  
15 Company's entire Pinal Valley Water Service Area ("PVWSA"), which includes the extension  
16 area, demonstrating sufficient physically available groundwater supplies to serve the PVWSA.

17  
18 7. On November 15, 2007, on the Company's behalf, Clear Creek Associates filed a  
19 Physical Availability Demonstration ("PAD") application with ADWR demonstrating more than  
20 sufficient groundwater supplies for over one hundred years.

21  
22 8. The Company's PAD is critical to allowing the developers in the transfer area to  
23 pursue a CAWS, but a CAWS is not possible at this time until the Company's PAD has been  
24 approved by ADWR.

25  
26 9. Most major economists declared the beginning of a deep recession, affecting the  
27 entire country and further depressing the housing market.

1           10.     On November 20, 2008 ADWR sent an Administrative Completeness Review  
2 letter (see Attachment 3 hereto) concerning the PAD to Clear Creek Associates indicating the  
3 remaining information needed to make the PAD application complete and following months of  
4 multiple meetings, and several updated submittals made by Clear Creek Associates to ADWR  
5 providing additional information and refinements to the regional groundwater model submitted  
6 with the initial PAD application.

7  
8           11.     Clear Creek Associates and the Company believe that its last updated PAD  
9 submittal, made on September 3, 2009 (see Attachment 4 hereto) fully addressed all of ADWR's  
10 requirements and expects a favorable determination by ADWR within the next few months.

11  
12           12.     Most economists believe that the current recession ended on or about July-August  
13 2009 (see Attachment 5, hereto).

14  
15           13.     Housing permits for single family residences issued in Pinal County, Arizona,  
16 where parcels in the extension area are located, dropped from an annual peak of 11,371 in 2005  
17 to 3,104 in 2008. The numbers of new housing permits continued to drop into 2009 which  
18 shows 1,507 permits issued through August 2009, however, over the past couple of months,  
19 housing permits have increased in Pinal County with the month of August 2009 showing 258  
20 new permits compared with 205 permits in august 2008 (see Attachment 6 hereto).

21  
22           14.     The developers, as well as any developer with a subdivision located in any AMA,  
23 cannot plat a subdivision without a CAWS, effectively preventing such developer from entering  
24 into an MXA or moving forward towards construction.

25  
26           Due to the foregoing factors, the Company is now requesting additional time to file the  
27 required compliance items for the transfer areas in compliance with the Decision. In support of  
28 its request, the Company respectfully further provides as follows:

- 1
- 2 1. A map of the extension area is attached hereto as Attachment 7.
- 3
- 4 2. With respect to the applicable CCN extension area, the Company is requesting
- 5 that the current compliance deadline, April 12, 2010, be extended for an
- 6 additional two (2) year period, until April 12, 2012. In support of this request the
- 7 Company submits the following:
- 8
- 9 a. Letters from owners of parcels in the extension area are attached (see Attachment
- 10 8) hereto. As noted in each letter, the owners still plan to develop their property
- 11 and still need and desire to receive water service from the Company.
- 12
- 13 b. With respect to the compliance requirement to file a Certificate of Assured Water
- 14 Supply - as documented by Attachments 3 and 4 hereto, the Company has
- 15 retained the firm of Clear Creek Associates to file a Physical Availability
- 16 Demonstration ("PAD") Application with the Department of Water Resources
- 17 ("ADWR") for an area that includes the extension area described in Attachment 7.
- 18 ADWR has commented on the PAD Application, and the Hydrologist, as
- 19 evidenced by its September 3, 2009 letter (Attachment 4) to ADWR and is
- 20 working diligently with ADWR to complete the Application.
- 21

22 While the PAD is not a certificate of assured water supply, it is a precursor to, and

23 a necessary requirement for obtaining a certificate. Therefore, the Company

24 submits that the PAD, and the Company's diligent pursuit of its approval, as

25 documented by Attachments 3 and 4, constitutes substantial compliance with the

26 Decision's requirement of this post-decision condition, particularly in view of the

27 other matters presented herein in support of the Company's request.

28

1 c. As discussed above, and as the Commission knows, the development and home-  
2 building industries in Pinal County essentially bottomed out in late 2008 bringing  
3 development to a near halt (see Attachment 5 hereto, an Economic Synopsis  
4 prepped by the Federal Reserve Bank of St. Louis), a fact over which the  
5 Company (and many other water and sewer utilities who have compliance  
6 obligations and have had to request CCN compliance extension deadlines) and the  
7 Commission obviously have no control, but one which did not exist when the  
8 Decision was entered; the Company submits that this economic reality should be  
9 an important determinant in the Commission acting favorably on the Company's  
10 request, as the continued existence of the Company's CCN for the extension area  
11 will help to support the now improving development market; conversely, the  
12 withdrawal of the CCN would be, the Company submits harmful to the  
13 development recovery; indeed the property owner letters attached to this Request  
14 confirm the owners' plans to develop their property in reliance on the Company's  
15 CCN.

16  
17 **CONCLUSION:**  
18

- 19 I. In view of the fact that, as detailed above, the Company has now filed all of the  
20 requested compliance items, the Company respectfully requests that the  
21 Commission enter an order finding that the Company has fully complied with the  
22 compliance items listed at page 8, lines 1-16 of the Decision.
- 23  
24 II. In the alternative, in view of the fact that, as detailed above, the Company has  
25 now filed the Approval to Construct and the Notice concerning the fully executed  
26 main extension agreement, and is in substantial compliance with respect to filing  
27 the CAWs, the Company respectfully requests that the compliance deadline under  
28 the Decision for the extension area be extended until April 12, 2012.

1 RESPECTFULLY SUBMITTED this 23<sup>rd</sup> day of November 2009.

2 **ARIZONA WATER COMPANY**

3  
4  
5 By: 

6 Robert W. Geake  
7 Vice President and General Counsel  
8 ARIZONA WATER COMPANY  
9 Post Office Box 29006  
Phoenix, Arizona 85038-9006

10 Original and thirteen (13) copies of the foregoing filed this 23<sup>rd</sup> day of November 2009 with:

11 Docket Control Division  
12 Arizona Corporation Commission  
13 1200 West Washington Street  
Phoenix, Arizona 85007

14 A copy of the foregoing was mailed this 23<sup>rd</sup> day of November 2009 to:

15 Honorable Lyn A. Farmer  
16 Chief Administrative Law Judge  
17 Hearing Division  
18 Arizona Corporation Commission  
1200 West Washington  
Phoenix, AZ 85007

19 Janice Alward, Chief Counsel  
20 Legal Division  
21 Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

22 Steve Olea  
23 Director, Utilities Division  
24 Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

1 Brian K. Bozzo  
2 Manager, Compliance and Enforcement  
3 Arizona Corporation Commission  
4 1200 West Washington Street  
5 Phoenix, Arizona 85007  
6

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# ATTACHMENT 1



## ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY CERTIFICATE OF APPROVAL TO CONSTRUCT WATER FACILITIES

Page 1 Of 2

<b>ADEQ File No:</b> 20090238	<b>LTF No:</b> 50565
<b>System Name:</b> Arizona Water Company	<b>System Number:</b> 11-009
<b>Project Owner:</b> City Of Casa Grande	
<b>Address:</b> 510 E. Florence Blvd., Casa Grande, AZ 85222	
<b>Project Location:</b> Casa Grande	<b>County :</b> Pinal
<b>Description:</b> CASA GRANDE PERFORMANCE INSITITUTE SPORTS COMPEX. INSTALL APPROXIMATELY 1030 LF OF 8 INCH DIP AND 143 LF 12 INCH DIP AND APPURTENANCES.	

*Approval to construct the above-described facilities as represented in the approved documents on file with the Arizona Department of Environmental Quality is hereby given subject to provisions 1 through 5 continued on page 2 through 2*

1. This project must be constructed in accordance with all applicable laws, including Title 49, Chapter 2, Article 9 of the Arizona Revised Statutes and Title 18, Chapter 5, Article 5 of the Arizona Administrative Code.
2. Upon completion of construction, the engineer shall fill out the Engineer's Certificate of Completion and forward it to the Central Regional Office located in Phoenix. If all requirements have been completed, that unit will issue a Certificate of Approval of Construction. R18-5-507(B), Ariz. Admin. Code. At the project owner's request, the Department may conduct the final inspection required pursuant to R18-5-507(B); such a request must be made in writing in accordance with the time requirements of R18-5-507(C), Ariz. Admin. Code.
3. This certificate will be void if construction has not started within one year after the Certificate of Approval to Construct is issued, there is a halt in construction of more than one year, or construction is not completed within three years of the approval date. Upon receipt of a written request for an extension of time, the Department may grant an extension of time; an extension of time must be in writing. R18-5-505(E), Ariz. Admin. Code.
4. Operation of a newly constructed facility shall not begin until a Certificate of Approval of Construction has been issued by the Department. R18-5-507(A), Ariz. Admin. Code.

Reviewed by: NLS

By: Janak K. Desai 8/10/2009  
Janak K. Desai, P.E. Unit Manager Date  
Engineering Review Section  
Water Quality Division

cc: File No : 20090238  
Regional Office: Central  
Owner: City Of Casa Grande  
County Health Department: Pinal  
Engineer: J2 Eng. & Env Design  
Planning and Zoning/Az Corp. Commission  
Engineering Review Database - Etr021

**APPROVAL TO CONSTRUCT  
POTABLE WATER LINE CONSTRUCTION  
ADEQ FILE No. 20090238  
PAGE 2 OF 2: PROVISIONS CONTINUED**

5. The Arizona Department of Environmental Quality's review of this application was subject to the requirements of the licensing time frames ("LTF") statute under Arizona Revised Statutes ("A.R.S.") § 41-1072 through § 41-1079 and the LTF rules under Arizona Administrative Code ("A.A.C.") R18-1-501 through R18-1-525. This Notice is being issued within the overall time frame for your application.

ADEQ hereby approves your application for Approval to Construct Water Facilities under A.R.S. § 49-351. Your copy is enclosed.

This decision is an appealable agency action under A.R.S. § 41-1092. You have a right to request a hearing and file an appeal under A.R.S. § 41-1092.03(B). You must file a written Request for Hearing or Notice of Appeal within **30 days** of your receipt of this Notice. A Request for Hearing or Notice of Appeal is filed when it is received by ADEQ's Hearing Administrator as follows:

Judith Fought, Hearing Administrator  
Office of Administrative Counsel  
Arizona Department of Environmental Quality  
1110 W. Washington Street  
Phoenix, AZ 85007

The Request for Hearing or Notice of Appeal shall identify the party, the party's address, the agency and the action being appealed and shall contain a concise statement of the reasons for the appeal. Upon proper filing of a Request for Hearing or Notice of Appeal, ADEQ will serve a Notice of Hearing on all parties to the appeal. If you file a timely Request for Hearing or Notice of Appeal you have a right to request an informal settlement conference with ADEQ under A.R.S. § 41-1092.06. This request must be made in writing no later than **20 days** before a scheduled hearing and must be filed with the Hearing Administrator at the above address.

Please contact Nancy Lou Sandoval at 602-771-4672 if you have questions regarding this Notice or the Certificate of Approval to Construct.

## ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006  
PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

September 9, 2009

Director of Utilities Division  
Arizona Corporation Commission  
1200 W. Washington St.  
Phoenix, AZ 85007

Re: Extension Agreement Approval

Dear Director:

We are submitting for your approval four copies of the Extension Agreement with:

City of Casa Grande  
3181 N. Lear Avenue  
Casa Grande, AZ 85222

Location: Casa Grande      Contract No.: 3758      W.A. No.: 4-4669

Also enclosed are our Cost Estimate, Data Sheet, and a map showing the location of the facilities to be installed. We are also enclosing a copy of the Arizona Department of Environmental Quality approval for this project.

Please return three copies of the Agreement to our office. If you have any questions concerning this Agreement, please contact our office at your convenience.

Very truly yours,



Fredrick K. Schneider, P. E.  
Vice President – Engineering  
[engineering@azwater.com](mailto:engineering@azwater.com)

afh  
Enclosure



# ARIZONA WATER COMPANY

## AGREEMENT FOR EXTENSION OF WATER FACILITIES

APPLICANT: City of Casa Grande  
3161 N. Lear Avenue  
Address  
Casa Grande, AZ 85222  
City, State, Zip Code

Contract No. 3758  
W.A. No. 4-4669

DATE OF AGREEMENT August 3, 2009 WATER SYSTEM: Casa Grande

WATER FACILITIES: Install approximately 1030 LF of 6" D.I.P. and 143 LF of 12" D.I.P. with polywrap and related fittings West along Almirnte Road and the North and South along Corrales Drive A.K.A. Entrance Drive and install two 2" services and one 3" compound meter to provide a maximum total flow of 188 gallons per minute (GPM) to serve the Casa Grande Multi Use Sports Complex as per drawing (Attachment "B").

Refundable Advance for Construction:	143 LF of 12" and 1030 LF of 6" DIP w/related fittings and appurtenances, two 2" services and one 3" service	\$	135,670.00
Non-refundable Contribution in Aid of Construction:	Relocate Temporary Fire Hydrant and 6" stub	\$	15,876.00
	Less: Cost of Construction	\$	126,798.00
	<b>Total of Required Advance and Contribution (Check #1)</b>	\$	<b>27,448.00</b>

**CENTRAL ARIZONA PROJECT Hook-Up Fee ("CAP Fee") Payable After Agreement Approved by Arizona Corporation Commission (ACC)**

Number of Meters	Casa Grande		Coolidge		White Tank		CAP Fee
	In	Out	In	Out	In	Out	
5/8" x 3/4"	0						\$ -
1"	0						\$ -
2"	2						\$ 2,346.00
3"	1						\$ 2,347.00
4"	0						\$ -
6" or larger	0						\$ -
		Fee		Fee		Fee	
		\$208		\$150		\$500	\$ -
		\$208		\$150		\$500	\$ -
		\$1,173		\$800		\$1,667	\$ 2,346.00
		\$2,347		\$1,600		\$2,667	\$ 2,347.00
		\$3,667		\$2,500		\$5,333	\$ -
		\$7,333		\$5,000		\$8,333	\$ -
						Subtotal	\$ 4,693.00
Applicable Rate & Tax	0.069	0	0	0			\$ 323.82
<b>Total Non-refundable Hook-Up Fee Due Within 15 Days After Notification of ACC Approval (Check #2)</b>							<b>\$ 5,016.82</b>
<b>The Project Will Not Be Released to Construction Until the CAP Fee Has Been Paid.</b>							
<b>Total (of Two Checks Payable by Applicant)</b>							<b>\$ 32,464.82</b>

THIS AGREEMENT is made and entered into by and between ARIZONA WATER COMPANY, an Arizona corporation, (hereinafter called the "Company"), and the Applicant named above. In consideration of the services to be performed by the Company and the sum of money to be paid by the Applicant, in accordance with the related Cost Estimate, it is agreed as follows: (SEE ADDENDUM, ATTACHED HERETO)

- The Company will construct, or will arrange for the construction of the Water Facilities as described above.
- The Applicant will pay to the Company upon signing this Agreement the Total shown above, receipt of which is hereby acknowledged by the Company. The Total shown above to be paid by the Applicant to the Company is the Company's estimated cost of construction of the Water Facilities. The Company will determine and inform the Applicant of the actual cost of construction within sixty (60) days after the completion of construction or the Company's receipt of all invoices and charges related to the construction. If the actual cost of construction is less than the Total amount paid, the Company will refund the difference to the Applicant; conversely, if the actual cost of construction is more than the Total amount paid, the Applicant shall pay the difference to the Company within sixty (60) days of receipt of an invoice from the Company. However, if the actual cost is more than five percent (5%) greater than the Total amount paid, the Applicant will only be required to pay five percent (5%) more than the Total amount paid, unless the Company can demonstrate that the increased costs were beyond its control and could not be foreseen at the time the estimate for the Total amount paid was made. The Company and the Applicant further agree that the amount subject to refund pursuant to paragraph 3 of this Agreement shall be the refundable portion of the Company's actual cost of construction. Information about the actual cost of construction will be attached to this Agreement and forwarded to the Applicant.
- Refunds of any Advance for Construction shall be made as follows: Each year for a period of 10 years the Company shall pay to the Applicant or the Applicant's assignee or successor in interest, provided the Company has first received written notice and evidence of such assignment or succession and approved of same, an amount equal to 10 percent of the total gross annual revenue received by the Company from water sales to each bona fide Applicant whose service line is directly connected to pipelines installed pursuant to this Agreement. Refunds shall be made by the Company on or before August 31 of each year, covering any water revenues received during the preceding July 1 to June 30 period. Any balance remaining subject to refund at the end of the 10-year period shall become non-refundable. Aggregate refunds shall in no event exceed the total of the refundable Advance for Construction received from the Applicant. No interest shall be paid by the Company on any amounts paid hereunder.
- All Water Facilities installed under this Agreement shall be the sole property of the Company, and the Applicant shall have no right, title or interest in or to any such facilities.
- The size, design, type and quality of materials and of the system, location and manner of installation, shall be specified by the Company and shall comply with requirements of the Arizona Corporation Commission or other public agencies having authority therein.
- The Applicant agrees to furnish to the Company adequate and recordable easements and required surveying necessary to serve each parcel or lot within the Applicant's subdivision, tract, development, or project.
- The Applicant agrees that all easements and rights-of-way shall be free of obstacles which may interfere with the construction of the Company's Water Facilities. If the Applicant's subdivision, tract, development, or project involves road construction, all roads and drainageways will be brought to grade by the Applicant prior to the commencement of the installation of the Company's Water Facilities. No pavement or curbs shall be installed prior to completion of all Water Facilities. If any street, road, alley or drainageway is installed at a different grade or location after the beginning of the installation of Water Facilities, the Applicant shall bear all costs incurred by the Company to relocate the Water Facilities as a result of said facilities having improper cover or location. Such costs shall be non-refundable.
- The Applicant agrees to pay to the Company any additional costs incurred as a result of design changes made or caused by the Applicant or its employees, agents, servants, contractors or subcontractors, the Arizona Department of Environmental Quality, the Arizona Corporation Commission, any county health department or other public agency under whose jurisdiction the subject construction may fall, or anticipated or un-anticipated changes in existing Company facilities, due to any work associated with this subdivision, tract, development or project which causes said facilities to have improper cover or location.
- This Agreement shall be binding upon and for the benefit of the successors and assigns of the Company and the Applicant. No assignment or transfer of this Agreement by the Applicant shall be binding upon the Company or create any rights in the assignee until such assignment or transfer is approved and accepted in writing by the Company.
- This Agreement, and all rights and obligations hereunder, including those regarding water service to the Applicant, are subject to the Arizona Corporation Commission's "Rules and Regulations" and the Company's tariff schedule TC-243, "Terms and Conditions for the Provision of Water Service."

ARIZONA WATER COMPANY

Company

By: [Signature]

Title: Vice President - Engineering

City of Casa Grande

Applicant

By: [Signature]

Title: CITY MANAGER

**AGREEMENT FOR EXTENSION  
OF WATER FACILITIES**

This Addendum to Agreement for Extension of Water Facilities (the "Agreement") is made and entered into as of the 17th day of July, 2009 by and between Arizona Water Company ("Company") and the City of Casa Grande ("Applicant") for the extension of water service and facilities to serve the Casa Grande Multi Use Sports Complex (the "Subdivision").

The Agreement is hereby modified and amended by mutual agreement of the parties in the following particulars:

1. Section 1 of the Agreement is revised to read as follows:

Applicant will arrange for and bear the cost of the construction of all the mains, fire hydrants, and services for installation of approximately 143 LF of 12" Ductile Iron Pipe, 1,030 LF of 8" Ductile Iron Pipe with related fittings, two 2" services and one 3" service and relocate an existing temporary fire hydrant (collectively, the "Water Facilities") in accordance with plans and specifications reviewed and approved by the Company, and in accordance with the Company's current Construction Specifications & Standard Specification Drawings. Due to the distribution system limited capacity, water service shall be limited to 188 gallons per minute (GPM). The Company reserves the right to further reduce future flows if the Company's distribution system experiences low pressure problems. Upon final acceptance by the Company, Applicant shall thereafter transfer and convey the Water Facilities to the Company by Bill of Sale, together with a perpetual easement for the maintenance thereof, both documents to be prepared and approved by the Company. Applicant shall furnish any document pertaining to ownership and title as may be requested by Company including documents which evidence or confirm transfer of possession to Company, and good and merchantable title free and clear of liens, or which contain provisions for satisfaction of liens by Applicant. All risk or loss of the water facilities shall be with the Applicant until written acceptance by the Company, or any portions thereof. Applicant shall repair or cause to be repaired promptly, and at no cost to Company, all damage to the Water Facilities caused by Applicant's construction operations until all construction in development for Applicant has been completed. Applicant acknowledges that Company has the right to, and may in the future, connect its existing or future water systems to the Water Facilities.

2. Section 2 of the Agreement is deleted in its entirety.

3. Section 8 of the Agreement is revised to provide that the Applicant shall pay any additional costs incurred as the result of design changes made or caused by any of the persons or entities named therein and shall hold Company harmless therefrom.

4. It is further agreed that the Applicant will advise all contractors asked to bid the construction of the Water Facilities that Applicant will assign to the Company the duty of inspecting the installation of the Water Facilities for compliance with the Company's current Construction Specifications & Standard Specification Drawings, as referenced in Section 1 of this Addendum. If requested by Company, Applicant shall "oversize" the Water Facilities as

specified by Company. Company shall reimburse Applicant for the differential in material prices of the oversized pipe and appurtenances, versus the material prices of the pipe and appurtenances as specified by the Company in the approved plans.

The Applicant agrees to require the contractor which will be installing the Water Facilities to arrange for and attend a pre-construction conference with the Company's Division Manager at least two weeks prior to commencing construction of the Water Facilities. Applicant shall obtain from the Company a signed Commencement Notice before construction of the Water Facilities begins. Applicant's contractor shall comply with the Company's inspection and testing requirements for Water Facilities. Applicant shall give Company adequate notice when the Water Facilities are ready for inspection and testing.

The Company specifically reserves the right to withhold final acceptance of the Water Facilities unless said facilities have been constructed in accordance with the approved plans and specifications and are satisfactory to Company upon inspection and testing. Applicant agrees that it will promptly correct all material defects and deficiencies in construction, materials and workmanship upon request by Company made subsequent to inspection by Company and for one year following Company's written final acceptance of the Water Facilities in accordance with the terms of this Agreement.

Applicant hereby assumes the entire responsibility and liability for injury or death of any person, or loss or damage to any property contributed to or caused by the active or passive negligence or willful acts or omissions of Applicant, its agent, servants, employees, contractors or subcontractors in the execution of the work or in connection therewith. Accordingly, Applicant will indemnify and hold harmless the Company, its officers, directors, agents and employees from and against claims or expenses, including penalties and assessments and attorneys' fees to which they or any of them may be subjected by reason of such injury, death, loss, claim, penalty, assessment or damage caused by the active or passive negligence or willful acts or omissions of Applicant, its agents, servants, employees, contractors or subcontractors in the execution of the work or in connection therewith; and in case any suit or other proceeding shall be brought on account thereof, Applicant will assume the defense at Applicant's own expense and will pay all judgments rendered therein. In connection therewith, the Applicant shall maintain in full force and effect insurance at no less than the following minimum amounts:

***WORKER'S COMPENSATION***

In accordance with requirements of the laws of the State of Arizona.

***COMPREHENSIVE GENERAL LIABILITY***  
(Including contractual liability covering death, bodily injury and property damage)

Combined single limit of not less than \$1,000,000 for each occurrence.

***AUTOMOTIVE LIABILITY***  
(Including owned, non-owned and hired vehicles)

Combined single limit of not less than \$1,000,000 for each occurrence.

Such insurance shall name the Company, its officers, agents, and employees as additional insured and be primary for all purposes.

The Company will at all times have the right to require that all of such insurance be placed with insurance companies that are satisfactory to it. The Applicant shall file with the Company a certificate evidencing that each policy of insurance for the above coverages in the minimum amounts specified has been purchased and is in good standing.

Such certificate shall provide that notice be given to the Company at least thirty (30) days prior to cancellation or material change in the form of such policies or any of them. Such certificates shall be kept on file by the Company and the Company must have current certificates on file, or a certificate must accompany any bid proposal, before that proposal will be accepted by the Company.

It is agreed that the Company is not an agent for Applicant and shall not incur any costs or expenses on behalf of Applicant and that Applicant is not an agent for the Company and shall not incur any costs or expenses on behalf of the Company.

5. Applicant shall, within 60 days of operational acceptance of Water Facilities by Company, furnish Company with: (a) copies of all bills, invoices and other statements of expenses incurred by Applicant covering all of the costs of materials, equipment, supplies, construction and installation of the Water Facilities; (b) lien waivers and releases from contractors, subcontractors and vendors for materials, equipment, supplies and construction included in the Water Facilities; (c) receipts, specifying exact amount of payments in full by Applicant to all contractors, subcontractors and vendors for all materials, equipment, supplies, labor and other costs of construction of the Water Facilities; and, (d) 4-mil mylar "as-built" drawings certified as to correctness by an engineer registered in the State of Arizona and showing the locations, materials, sizes and pertinent construction details for Water Facilities.

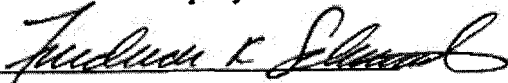
6. Upon final acceptance, Company will provide water service to the Subdivision in accordance with the rates, charges and conditions set forth in the tariffs of Company as filed with the Arizona Corporation Commission. Those rates are subject to change from time to time upon action by the Commission.

7. Applicant agrees that the completion of the Water Facilities will be timed so as to enable Company to provide water service to the Subdivision as such service is requested.

Except as set forth herein, and except as necessary to give effect hereto, the Agreement remains in full force and effect and is unmodified.

Company:  
Arizona Water Company

By:



Applicant:  
City of Casa Grande

By:



NOTE: THIS COST ESTIMATE IS GOOD UNTIL:  August 20, 2009  AFTER WHICH TIME IT IS SUBJECT TO REVISION UNLESS THE ATTACHED AGREEMENT HAS BEEN EXECUTED.	<b>ARIZONA WATER COMPANY</b> <b>COST ESTIMATE</b>		DATE PREPARED: 7/16/2009 Attachment "A"	
	PREPARED BY:  JOE WHELAN	SYSTEM:  CASA GRANDE		
	PROJECT LOCATION  SE 1/4 SEC. 20 T. 6 S., R. 5 E.		DRAWING NO.	
PROJECT DESCRIPTION:  Install approximately 1030 LF of 8" D.I.P. and 143 LF of 12" D.I.P. with polywrap and related fittings West along Almirnte Road and the North and South along Corrales Drive A.K.A. Entrance Drive and install two 2" services, one 3" compound meter to serve the Casa Grande Multi Use Sports Complex				
<b>MATERIALS &amp; LABOR</b>			<b>ESTIMATED PROJECT COST</b>	
ACCOUNT	QUANTITY	DESCRIPTION	REFUNDABLE ADVANCE	NON-REFUNDABLE CONTRIBUTION
343	143	12" D.I.P. W/POLYWRAP AND RELATED FITTINGS	\$ 22,037	
343	1,030	8" D.I.P. W/POLYWRAP AND RELATED FITTINGS	51,594	
345	2	INSTALL 2" SERVICE CONNECTION	3,294	
345	1	INSTALL 3" COMPOUND METER COMPLETE	7,956	
343	1	NON-EXEMPT PIPE RELATED MATERIALS	7,626	
345	1	NON-EXEMPT SERVICE RELATED MATERIALS	7,740	
346	1	3" COMPOUND METER	1,503	
346	2	2" COMPOUND METER	1,918	
343	1	CONTRACTOR TAX & BONDS	11,958	
343	1	AWC TESTING AND INSPECTION	8,500	2,400
348	1	RELOCATE EXISTING TEMPORARY FIRE HYDRANT TO ALMIRNTE DR.		1,550
344	1	8" STUB WITH VALVE AND BLOWOFF		13,045
<b>SUBTOTAL - MATERIALS &amp; LABOR</b>			<b>\$ 124,126</b>	<b>\$ 16,995</b>
<b>OVERHEAD</b>			<b>11,544</b>	<b>1,581</b>
<b>TOTAL REFUNDABLE AND NON-REFUNDABLE ESTIMATED PROJECT COST</b>			<b>\$ 135,670</b>	<b>\$ 18,576</b>
<b>TOTAL ESTIMATED PROJECT COST</b>			<b>\$154,246</b>	

→ FUNDS TO BE ADVANCED PRIOR TO EXECUTION OF AGREEMENT FOR EXTENSION OF WATER FACILITIES  
 → TOTAL FUNDS REQUIRED \$27,446

JJW

## WATER USE DATA SHEET

<b>NAME OF COMPANY</b> _____	<b>ARIZONA WATER COMPANY - Casa Grande</b>
<b>ADEQ Public Water System No.</b> _____	<b>11-009</b>

MONTH/YEAR (LAST 13 MONTHS)	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)	GALLONS PUMPED	GALLONS PURCHASED
July-09	23,141	479,374	506,395	0
June-09	23,073	419,969	527,619	0
May-09	23,054	384,275	426,931	0
April-09	22,962	311,985	369,877	0
March-09	22,935	270,808	355,311	0
February-09	22,927	260,508	265,134	0
January-09	22,911	249,759	274,846	0
December-08	23,014	412,721	289,878	0
November-08	22,992	395,379	373,843	0
October-08	22,970	289,086	480,811	0
September-08	22,994	417,658	415,433	0
August-08	22,970	475,216	469,010	0
July-08	22,948	466,539	506,501	0

STORAGE TANK CAPACITY (Gallons)	NUMBER OF EACH	ARIZONA DEPT. OF WATER RESOURCES WELL I.D. NUMBER	WELL PRODUCTION (Gallons per Minute)
Burgess Peak 2,000,000	1	D(6-6)9bbd - Casa Grande #9	1,000
Casa Grande Mtn 5,000,000	1	D(6-6)21bbc - Casa Grande #10	1,040
Cottonwood 1,000,000	1	D(6-6)23cbb - Casa Grande #19	1,560
Golf Course 115,000	1	D(6-6)22ddd - Singh/Quaid #22	1,000
Indian Hills 100,000	1	D(6-6)22bda - Casa Grande #25	1,320
North Park 650,000	1	D(6-6)21bbb - Cottonwood Lane #14	250
North Park 35,000	1	D(6-6)22bad - Casa Grande #20	1,110
Scott Drive 110,000	1	D(6-6)22baa - Casa Grande #23	1,550
Scott Drive 5,000,000	1	D(6-6)15cdd - Casa Grande #26	1,400
Tierra Grande #1 10,000	1	D(7-6)35ddd - AZ City/Bartaglia #28	1,620
Tierra Grande #1 250,000	1	D(6-6)15ccb - Casa Grande #17	850
		D(6-6)22cdc - Casa Grande #21	740
		D(6-6)22cdd - Casa Grande #24	950
		D(6-7)5baa - Lake-in-the-Desert #27	550
		D(6-6)25dcd - Casa Grande #29	1,380
		D(6-6)22ddd Casa Grande #30	1,000
		D(6-6)15cad - Casa Grande #31	1,500
		D(8-6)1ddb - Del Rio #34	1,500

Other Water Sources in Gallons per Minute (Non-Potable CAP Water) _____	GPM	1583
Fire Hydrants on System _____	YES	NO
Total Water Pumped Last 13 Months (Gallons in Thousands) _____		5,261,589

\* Treated CAP Water

# ATTACHMENT 3

## ARIZONA DEPARTMENT OF WATER RESOURCES

### Office of Assured and Adequate Water Supply

2<sup>nd</sup> Floor, 3550 N. Central Ave, Phoenix, AZ 85012

Telephone 602 771-8585

Fax 602 771-8689



November 20, 2008

Steven W Corell  
Clear Creek Associates, LLC  
6155 E. Indian School Rd.  
Suite 200  
Scottsdale AZ, 85251

Janet Napolitano  
Governor

Herbert R. Guenther  
Director

**Re: Application for a Physical Availability Determination  
Arizona Water Company - Pinal Valley Water Service Area (DWR No. 51-700444.0000)  
Administrative Completeness Review**

Dear Mr. Corell:

We received the above referenced application for a Physical Availability Determination (PAD) on November 15, 2007. During our administrative review, we have determined the application to be incomplete and notified you of the incomplete items in a letter dated February 28, 2008. On August 25, 2008, Clear Creek Associates submitted a response to the incomplete items. The response was a supplement to the original model submitted by Arizona Water Company (AWC) on November 15, 2007.

The numeric model as resubmitted by AWC was re-evaluated by the Department of Water Resources Hydrology Division. Compared to the previously submitted AWC model, the revised AWC model has been changed significantly. Some of the significant changes include a revised pumpage distribution among the three model layers, a reconfiguration of model boundaries, a revised distribution of hydraulic parameters and updated recharge properties. The revised AWC model has been reviewed in accordance with ADWR's *Substantive Policy Statement on Hydrologic Guidelines for AWS* signed August 31, 2007. The following is a list of deficiencies that need to be clarified and/or corrected before the review of the application can be completed:

1. Groundwater Underflow and Boundary Conditions

Groundwater underflow was simulated in the revised AWC model through a combination of general head boundaries, constant flux boundaries and recharge boundaries. The following address the comments regarding each type of boundary condition simulated in the model.

a) Constant Flux Boundary

Groundwater underflow from the South Picacho Peak and the Cactus Forest were simulated through constant flux boundaries. In the 100-year projection model, these two groundwater underflow components (i.e. 24,000 AFY (acre-feet per year) in total) were diminished since 2030 (stress period 24, the same number of stress period used in the transient calibration model). The applicant must explain if this is a data input error or provide evidence to support the diminished groundwater underflow of these two areas.

b) General Head Boundary

Groundwater underflow through the Florence gap and the gap between the Santan and Sacaton Mountains were simulated through general head boundaries (GHB). However, these two

boundaries were only assigned in model layer 3. No GHB boundaries were specified in model layer 1, and only the GHB boundary at the Florence gap was simulated in model layer 2. The applicant must justify the need for the different configurations for the 3 model layers.

c) Recharge Boundary

Groundwater underflow through Santa Rosa, Waterman Wash, the north Picacho Peak and the Maricopa Stanfield gap were simulated through recharge boundaries. In other words, all the underflow were applied to model layer 1, and these volume could potentially percolate down to other layers when the vertical conductance is adequate or when layer 1 becomes dry. The use of recharge boundary to simulate underflow through the Maricopa Stanfield gap is not appropriate. In this area, significant vertical hydraulic heterogeneity is exhibited. Hydraulic conductivity in layer 1 (varies from 50 ft/day to 100 ft/day) is significantly larger than that of layer 2 which ranges from 3 ft/day to 5 ft/day. When the underflow volume of 29,450 AFY was applied to layer 1, water tends to flow more quickly in the horizontal direction in layer 1 rather than to percolate down to layer 2 or 3 due to the existence of the thick fine grained layer 2. As a result, the model simulated a significant vertical gradient between layer 1 and layers 2 and 3, and the head difference between layer 1 and layers of 2 and 3 could be more than 350 ft (see Figure 1 attached). The ADWR recommends the use of a specified flux boundary which assigns appropriate amount of underflow to each layer. This method is considered to be a more appropriate way to simulate this underflow.

The revised AWC modeling report mentioned that the groundwater underflow of 3,700 AFY through the Aguirre Valley was simulated through a recharge boundary. Review of modeling files indicated that this recharge component was not simulated in the model. The applicant is required to explain the missing underflow component.

2. Recharge

a) Total Recharge

Total recharge simulated in the revised model was compared to those simulated in the previously submitted AWC model. Among all the recharge components, only the agricultural recharge component was changed significantly to account for the effect of the lagged agricultural recharge. The table below (Table 1) compares the difference on the total recharge estimated between the revised and the previously submitted AWC models.

According to this table, the total recharge simulated in the revised model is about 1.4 to 1.7 times of that simulated in the previous model. The ratio of the total simulated recharge in the revised model over the conceptual total recharge reported in the previous model varies from 1.4 to 2.0. These comparisons show that recharge has been increased significantly in the revised model.

**Table 1. Recharge Comparisons**

Year	Conceptual	Old Model	Revised Model	Revised/Old	Revised/Conceptual
1985	483,086	512,655	713,473	1.4	1.5
1988	345,317	381,610	569,966	1.5	1.7
1998	282,492	324,569	565,172	1.7	2.0
2003	247,838	244,646	343,386	1.4	1.4

Note. All the recharge volume is in the unit of AFY

b) Agricultural Recharge

By accounting for the impact of the agricultural recharge lag time, which is assumed to be 20 years in the revised modeling report, the agricultural recharge was increased significantly. The agriculture recharge simulated in the revised model ranges from 261,707 AFY to 574,053 AFY. When the lag time is not considered, the conceptual agricultural recharge reported in the previous AWC modeling report ranges from 204,717 AFY to 377,129 AFY. The maximum increase of agriculture recharge was as much as 301,126 AFY in 1993. Initial estimate of the agricultural recharge by considering a 20 year lag time ranges from 198,000 AFY and 468,400 AFY. The calibrated agricultural recharge exceeds the initial estimate for all the years of the transient model (1984~2007). The agricultural recharge was over simulated and must be re-conceptualized.

A constant agricultural recharge was simulated for SCIDD, CAIDD, MSIDD, and HOHOKAM from early 1980s to 1998. After 1998, the estimated agricultural recharge for each of the irrigation districts started to fluctuate. The applicant is required to include discussions in the report to address this temporal recharge distribution (see Figure 2).

c) Gila River Recharge

The revised modeling report indicates that the Gila River recharge was simulated at the median value of 7,450 AFY for the 100-year projection. However, analysis of the modeling files indicates that this recharge was actually simulated at a value of 4,995 AFY. The applicant must correct this discrepancy.

d) Waterman Wash and South Picacho Peak Recharge

Table 9 in the AWC report presents the 100-year (2107) modeled recharge volume. The 100-year recharge volume was also calculated based on modeling input. Comparisons of the two indicate some discrepancies. Specifically, the Waterman Wash recharge and the recharge through the S. Picacho Peak were reported to be 749 AFY and 311 AFY, respectively. Based on modeling input, zero recharge was simulated at the S. Picacho Peak, and 612 AFY recharge were simulated at the Waterman Wash. The applicant must correct this discrepancy.

3. Hydraulic Conductivities

- a) The report referenced USGS's (Pool and Other's) estimate of hydraulic conductivities in the Eloy sub-basin, and they range from 30 ft/day to 100 ft/day. The model calibrated UAU and LCU hydraulic conductivities, however, range from 8 ft /day to 30 ft/day for majority of the Eloy sub-basin, except for along the Gila River area, where a high k of 175 ft/day was calibrated. In general, the hydraulic conductivity appeared lower than estimated by Pool and others.
- b) Due to the lack of sufficient pumping test data, the revised AWC model calibration relied on specific capacity data for wells in the area. In areas where both specific capacity data and pumping test data are available, the conductivity estimate based on well specific capacity data tends to be lower than that estimated by aquifer pumping tests. Please provide a narrative on the reliability of using specific capacity data for estimation of hydraulic conductivity values used in the model.
- c) Concerning the analysis of an aquifer test in D-05-03 26ACC. Hydrology re-analyzed both the "constant rate" and recovery data for the tested well. Our analysis shows an average K-value of 14 ft/d. The K-values determined by ADWR are estimated by dividing the transmissivity value by the full saturated thickness of the well [depth of completed well (418 ft.) – static water level (128 ft.) = 290 ft]. It may be that the applicant is using the screened interval (200 ft) to estimate the K-value. This would account for their higher estimated values. The transmissivity value obtained from the results of an aquifer test should best represent the saturated thickness of the completed well and should not be just limited to the screened interval.

It is important to note that while the test is presented as a "constant rate" test, the plot of the drawdown curve clearly shows the test more closely resembles a "step-test".

Finally, it is also important to note that after 24 hours, the well had not fully recovered. The maximum drawdown after 24 hours was 109 ft. However, after 24 hours of recovery, the water level had only risen 99 feet.

#### 4. Calibration Residuals

Calibration residuals for the selected calibration years were summarized in Table 2 below. As shown in the table, the mean residual errors in Layer 1 for all the selected calibration years are negative values, indicating that water level at observation wells are under simulated. On the contrary, all the mean residual errors in layer 2 are positive values, indicating that water level are over simulated. Water levels in layer 3 are mostly over simulated except for 2003 when they are largely under simulated. The residual error patterns suggest the need of additional model calibration effort.

The layer specific water budget usually provides useful information on how groundwater interacts among different layers. The layer specific water budgets for selected calibration years were summarized in Table 3 below. As indicated in Table 3 below, the dominant inflow component is recharge, and recharge is primarily applied to layer 1. Even with the significantly increased agricultural recharge, layer 1 water levels were shown to be apparently under simulated. In layer 2 and 3 where much less recharge was simulated, water levels were shown to be over simulated. The residual error pattern also suggests the possible presence of model errors on hydraulic parameters including the distribution of hydraulic conductivity and vertical conductance.

The residual error patterns noted above must be carefully examined and related to the overall effect that they have on the results on the model.

Table 2 – Calibration Results per Layer as Calculated by the ADWR

Year	Layer 1			Layer 2			Layer3			All Layers		
	# of wells	ME	MAE	# of wells	ME	MAE	# of wells	ME	MAE	# of wells	ME	MAE
1985	59	-14.8	24.5	15	24.9	37.3	17	6.3	24.9	91	-4.3	26.7
1988	56	-16.7	33.4	43	50.1	61.9	17	11.2	26.7	116	12.2	43.0
1998	51	-27.9	51.9	38	19.9	40.9	18	1.3	35.1	107	-6	45.2
2003	46	-29.3	51.5	29	10.8	38.7	13	-20.6	41.9	88	-14.8	45.8

ME = Mean residual error; MAE =Mean Absolute Residual Error

Table 3 – Layer Specific Water Budgets as Calculated by the ADWR

Layer Specific Budget	1985			1998		
Inflow Components	Layer 1	Layer 2	Layer 3	Layer 1	Layer 2	Layer 3
Storage	112,075	10,307	101,087	37,600	62	8,226
Top	-	314,529	148,426	-	247,977	120,829
Bottom	23,400	30,325	-	13,853	17,432	-
Constant Head	-	-	-	-	-	-
Wells	8,601	141	13,046	8,893	144	13,130
Recharge	614,880	15,496	80,435	470,145	13,293	79,072
GHB	28	-	21	-	-	-
Subtotal	758,985	370,798	343,014	530,491	278,908	221,257

<b>Outflow Components</b>						
Storage	293,907	43,713	62,919	175,512	33,390	45,361
Top	-	23,400	30,325	-	13,853	17,432
Bottom	314,529	148,426	-	247,977	120,829	-
Constant Head	-	-	-	-	-	-
Wells	149,412	155,246	240,966	102,310	110,823	136,471
GHB	1,128	-	8,783	4,683	-	22,007
<b>Subtotal</b>	<b>758,976</b>	<b>370,785</b>	<b>342,994</b>	<b>530,483</b>	<b>278,895</b>	<b>221,271</b>

5. Observed vs. Model Simulated Water Elevation Contours

In 2003, the model simulated groundwater elevation contours are significantly different from the observed ones, especially in Maricopa Stanfield sub-basin, where the difference could be as much as 250 ft. The applicant must address the error within the model calibration or re-conceptualization.

6. Inactive Section of Layer 3

In the central Eloy sub-basin, due to the large thickness of layer 2 and 3, the bottom of the model exceeds 3,000 ft. As a result, layer 3 in this area was determined to be inactive in the revised AWC

model. The layer 3 thickness in the area could be as much as 2,000 ft. The extent and the location of the inactive portion of the model could potentially distort the groundwater flow direction in this area. A recommended alternative method would be to simulate the layer 3 in this area through a thin layer (50 ft or 100 ft in thickness) with fudged conductivity values to maintain the realistic transmissivity values in this area.

7. Sensitivity Analysis

The report includes a table summarizing the model sensitivity results with regard to hydraulic parameters of conductivity, specific storage and specific yield. As shown in this table, the model is most sensitive to the reduced values of specific yield, and relatively sensitive to hydraulic conductivity, and generally insensitive to changes in specific storage. Since the sensitivity results were evaluated by comparison of the sum of the squared residuals to the transient calibrations, the lack of calibration targets in layer 2 and 3 especially in the area where thick clay layer exists could partially skew the conclusions regarding the model's insensitivity to changes on specific storage.

Due to the lack of details, it is not clear how the sensitivity analysis was performed. Since each hydraulic parameter tested (i.e. conductivity, specific yield, and specific storage) has many zones in different model layers, it is not clear if one zone of each parameter was tested or all the zones of each parameter were tested simultaneously. The applicant must provide greater detail of how the sensitivity analysis was performed.

8. Rewetting Function

The rewetting function is not activated in the revised AWC model. As groundwater levels in Pinal AMA have been observed to recover rapidly since 1980s due to the use of CAP water and accordingly reduced groundwater pumpage. The activation of the rewetting function in the MODFLOW could, in theory, help to better simulate groundwater conditions in Pinal AMA. It is understood that the rewetting function might not work as well as expected some times; however, the applicant must include a discussion of this function in the report.

9. General Concerns

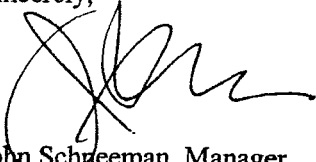
- a) The AWC updated total committed demand volume for Maricopa-Stanfield sub-basin is acceptable. The CCA response states that Tables 14 and 15 summarize the (non-AWC) current and committed water demand simulated in the model and include well locations for the Maricopa-Stanfield and Eloy sub-basins. However, the attached tables in the response did not reflect this revised information and must be updated with the correct demand values and well locations.
- b) There is a groundwater pumping deficit of around 60,000 af/yr simulated in the model versus the pumping volume the Department estimates should be in the model. The deficit appears to be due to the non-inclusion of Indian (SCIP and GRIC) pumping and a volume of long-term storage credits (LTSC) that are too low. However, the deficit may also be caused by model cells dewatering that contain projected pumpage. The defect remains fairly steady to around 2020 and then starts growing to a high of around 117,000 af/yr in 2057. Due to the removal of LTSC, the deficit drops to around 85,000 af/yr and remains at this volume to 2107. Overall, the volume simulated in the model is ~8.8 million acre-feet short of what was projected by ADWR (60,095,147 simulated vs. 69,918,698 projected). This must be addressed by the applicant.
- c) Based on recognition that there is a significant pumping deficit in the model it is not possible to determine at this time whether there will be projected negative impacts (dewatering of projected Assured Water Supply (AWS) groundwater withdrawal locations or projected 100-year depths to static water that exceed 1,100 feet) for holders of issued AWS certificates, designations or analyses in the model area. Once the deficit pumping issues are suitably addressed it will be necessary for the applicant to determine if negative impacts are projected for any issued AWS

permit holders, and if so, modify the projected 100-year AWC groundwater demands to mitigate any such potential negative impacts.

Please submit the requested information to the Office of Assured Water Supply within 60 days of this notice. Our review of your application has stopped and will resume when we receive the missing items. If you do not respond to this letter within the 60-day time frame, the director of the Department may take action to deny the application and close the file.

If you have any questions regarding the contents of this letter or the application in general, please do not hesitate to contact Norma Coupaud at (602) 771-8598.

Sincerely,

A handwritten signature in black ink, appearing to read 'John Schneeman', with a large circular flourish at the beginning.

John Schneeman, Manager  
Office of Assured and Adequate Water Supply

JFS/njc

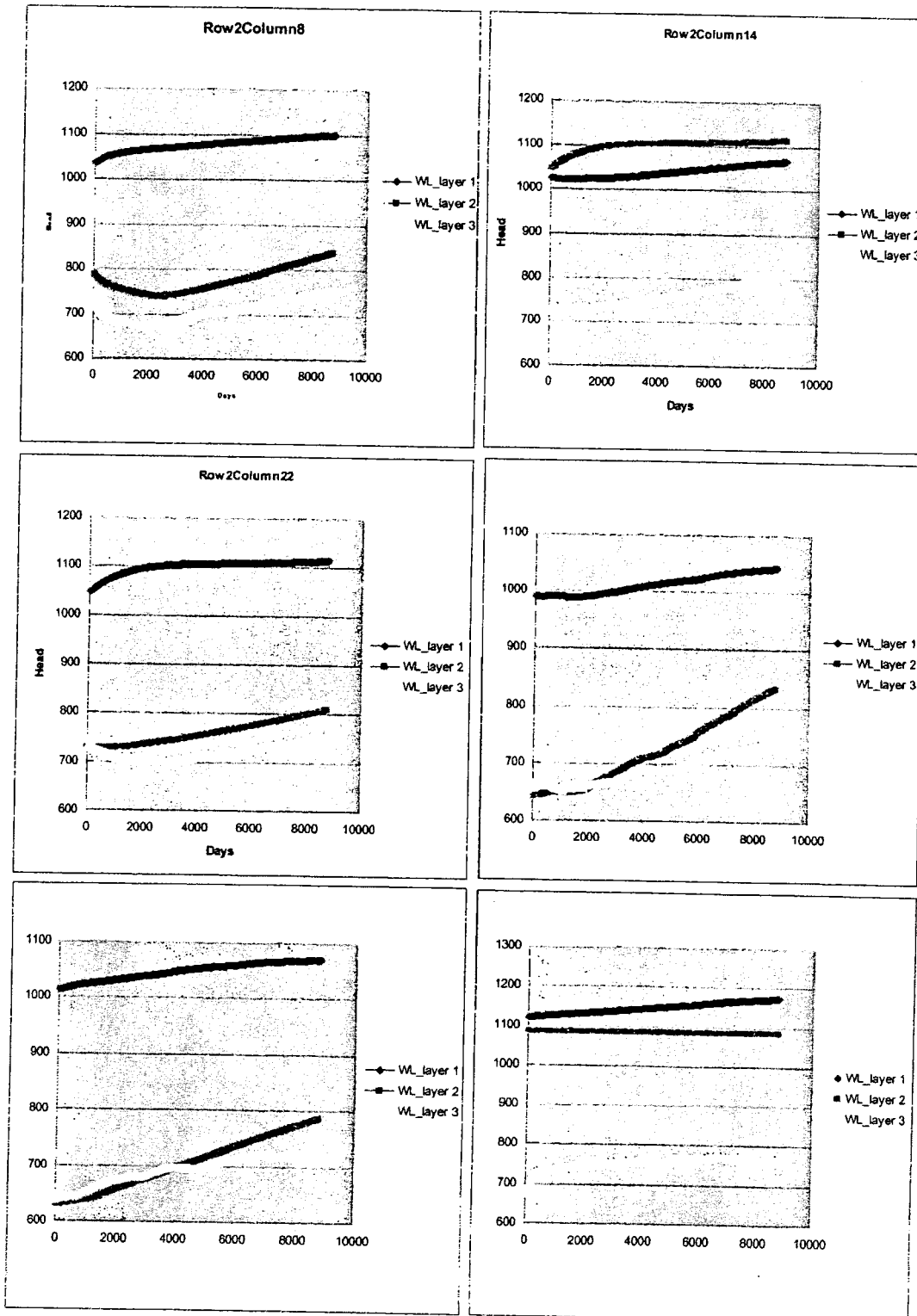
cc: Bill Garfield, Arizona Water Company  
Drew Swieczkowski, ADWR Hydrology  
Sandra Fabritz-Whitney, ADWR Water Management

Attachments

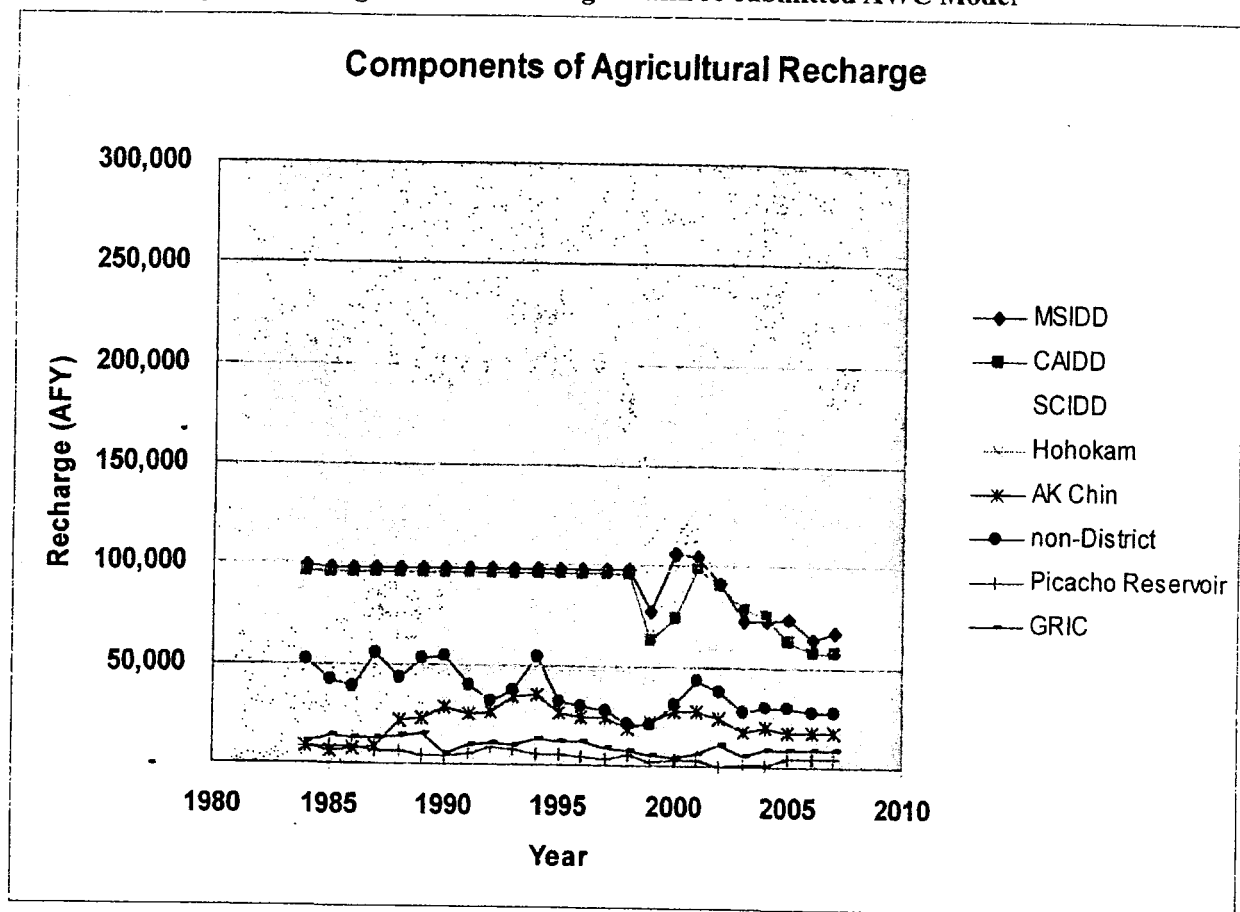
**Table 4 – Simulated Water Budget Comparison between Previous and Resubmitted AWC Model**

AWC model 082608	1	2	5	10	15	20	24
	1984	1985	1988	1993	1998	2003	2007
<b>Inflow Components</b>							
Storage	384,127	224,593	126,023	21,725	46,212	184,729	135,361
Constant Head	-	-	-	-	-	-	-
Wells	22,277	21,788	21,843	22,114	22,167	22,522	22,522
Recharge	752,407	713,473	569,966	1,169,464	565,172	343,386	325,252
GHB	787	49	-	-	-	-	-
<b>Subtotal</b>	<b>1,159,598</b>	<b>959,904</b>	<b>717,832</b>	<b>1,213,303</b>	<b>633,551</b>	<b>550,637</b>	<b>483,135</b>
<b>Outflow Components</b>							
Storage	613,697	403,468	228,359	979,779	256,747	86,783	83,350
Constant Head	-	-	-	-	-	-	-
Wells	539,546	546,490	478,475	205,486	349,604	441,843	381,630
GHB	6,381	9,913	10,999	27,959	26,744	22,008	18,166
<b>Subtotal</b>	<b>1,159,623</b>	<b>959,870</b>	<b>717,833</b>	<b>1,213,225</b>	<b>633,096</b>	<b>550,634</b>	<b>483,147</b>
total in flow	775,471	735,311	591,809	1,191,578	587,339	365,908	347,774
old model	1	2	5	10	15	20	24
	1984	1985	1988	1993	1998	2003	2007
<b>Inflow Components</b>							
Storage	554,458	414,035.6552	297,015.9513	91,536.31049	143,846.8184	239,297.5947	210,594.2075
Constant Head	-	-	-	-	-	-	-
Wells	-	-	-	-	-	-	-
Recharge	472,478	512,655	381,610	882,696	324,569	244,646	264,090
GHB	52,569	53,498	60,922	62,870	68,543	71,006	71,218
<b>Subtotal</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Outflow Components</b>	<b>1,079,505</b>	<b>980,188</b>	<b>739,548</b>	<b>1,037,103</b>	<b>536,959</b>	<b>554,950</b>	<b>545,903</b>
Storage	530,686	420,342	251,122	804,789	167,338	103,382	79,342
Constant Head	-	-	-	-	-	-	-
Wells	541,425	549,215	478,179	206,330	351,119	438,865	457,960
GHB	7,406	10,631	10,251	25,954	18,486	12,715	8,656
<b>Subtotal</b>	<b>1,079,517</b>	<b>980,187</b>	<b>739,551</b>	<b>1,037,072</b>	<b>536,942</b>	<b>554,962</b>	<b>545,958</b>
total inflow	525,047	566,153	442,532	945,566	393,112	315,653	335,309

**Figure 1 – Simulated Northwest Boundary per Model Layer**



**Figure 2 – Components of Agricultural Recharge within re-submitted AWC Model**





*Practical Solutions  
in Groundwater Science*



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April 22, 2009

Mr. John Schneeman, Manager  
Arizona Department of Water Resources/Assured and Adequate Water Supply  
3550 N. Central Avenue  
Phoenix, Arizona 85007

**DRAFT Response to Administrative Completeness Review (dated November 20, 2008)  
Application for a Physical Availability Demonstration Item Nos. 3 to 8  
Arizona Water Company - - Pinal Valley Water Service Area (ADWR File No. 51-  
700444.0000)**

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Dear Mr. Schneeman:

This draft letter has been prepared by Clear Creek Associates, PLC (CCA) on behalf of Arizona Water Company in response to the Administrative Completeness Review letter (completeness review letter) from the Arizona Department of Water Resources (ADWR) dated November 20, 2008, for the Pinal Valley Water Service Area (PVWSA) Application for Physical Availability Demonstration (PAD, ADWR File No. 51-700444.0000). The completeness review letter was discussed in meetings with Department staff held on December 16, 2008 and March 6, 2009. As discussed in our March 6, 2009 meeting with Department staff we will be submitting a series of draft responses to the points outlined in the Departments November 20, 2008 letter, and include necessary supporting attachments. This draft letter responds to item numbers 3 to 8 as presented in the Departments letter. The comments presented in the subject letter are presented below in italics followed by our response.



3) Hydraulic Conductivities

- a) *The report referenced USGS (Pool and others) estimate of hydraulic conductivities in the Eloy sub-basin, and they range from 30 ft/day to 100 ft/day. The model calibrated UAU and LCU hydraulic conductivities, however, range from 8 ft/day to 30 ft/day for majority of the Eloy sub-basin, except for along the Gila River area, where a high  $k$  of 175 ft/day was calibrated. In general, the hydraulic conductivity appeared lower than estimated by Pool and others.*

**Response:** The revised AWC model currently has hydraulic conductivity values in the Upper Alluvial Unit (model layer 1) that range from 10 to 175 ft/d. Pool and others (2001<sup>1</sup>) indicated that the hydraulic conductivity for most of the alluvial facies of the upper unit ranges from 30 to 60 ft/d with the lower range of values occurring in fine-grained sediments southwest of Eloy and south of Coolidge. Higher values of 70 to 100 ft/d are associated with coarse-grained sediments along the Gila River, south of the Casa Grande Mountains, east of Eloy, and between the Silverbell Mountains and Picacho Peak (Pool and others, 2001). USGS estimates were developed based on a relation of hydraulic conductivity to grain size. Figure 1 illustrates the current modeled hydraulic conductivity values of the UAU (Layer 1) with posted aquifer test data and specific capacity data.

The revised AWC model currently has hydraulic conductivity values in the Middle Silt and Clay Unit (model layer 2) that range from 5 to 20 ft/d. The playa facies of the middle unit is predominantly fine-grained – less than 20 percent sand and gravel – but is more dense and less porous than similar sediments in the upper unit; therefore, values of hydraulic conductivity probably are less than 20 ft/d (Pool and others, 2001). Figure 2 illustrates the current modeled hydraulic conductivity values of the MSCU (Layer 2) with posted aquifer test data and specific capacity data.

The revised AWC Model has hydraulic conductivity values in the Lower Conglomerate Unit (model layer 3) that range from 2 to 20 ft/d. The playa facies of the lower unit is more dense and less porous than the middle unit; therefore, lower values of hydraulic conductivity are likely (Pool and others, 2001). The conglomerate of the lower unit is similar to conglomerate found in the western part of the Salt River Valley, which has hydraulic-conductivity values of about 10 ft/d (Brown and Pool, 1989). Higher values of modeled hydraulic conductivity in the Maricopa-Stanfield sub-basin are based on aquifer test data. Figure 3 illustrates the current modeled

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<sup>1</sup> Pool, D.R., Carruth, R.L., and Meehan, W.D., 2001. Hydrogeology of Picacho Basin, South-Central Arizona. USGS Water Resources Investigations Report 00-4277.



hydraulic conductivity values of the LAU (Layer 3) with posted aquifer test data and specific capacity data.

- b) *Due to the lack of sufficient pumping test data, the revised AWC model calibration relied on specific capacity data for wells in the area. In areas where both specific capacity data and pumping test data are available, the conductivity estimate based on well specific capacity data tends to be lower than that estimated by aquifer pumping tests. Please provide a narrative on the reliability of using specific capacity data for estimation of hydraulic conductivity values used in the model.*

**Response:** For the revised AWC model, hydraulic conductivity values were calculated from specific capacity data obtained from ADWR and AWC. Specific capacity is calculated by dividing the pumping rate by the drawdown. If specific capacity data is constant except for the time variation, it is roughly proportional to the transmissivity of the aquifer (Lohman and others, 1972<sup>2</sup>). Values of transmissivity calculated from specific capacity data were based on the following relationship (Driscoll, 1986<sup>3</sup>):

$$Q/s = T/2000$$

Where:

Q = well yield (gpm)

s = well drawdown (ft)

T = transmissivity (gpd/ft)

Among the factors that affect the transmissivity calculation from specific capacity data are the accuracy with which the thickness of the zone supplying water to the well can be estimated, the magnitude of the well loss in comparison with drawdown in the aquifer, and the difference between the "nominal" radius of the well and its effective radius (Heath, R.C., 1983<sup>4</sup>).

Relative to these factors, the common practice is to assume that the value of transmissivity estimated from specific capacity applies only to the screened zone. To apply this value to the entire aquifer, the transmissivity is divided by the length of screen (to determine the hydraulic

---

<sup>2</sup> Lohman, S.W., and others, 1972. Definitions of Selected Ground-Water Terms-Revisions and Conceptual Refinements, USGS Water Supply Paper 1988.

<sup>3</sup> Driscoll, F.G., 1986. Groundwater and Wells, Johnson Division, St. Paul, MN, 1098 p.

<sup>4</sup> Heath, R.C., 1983. Basic Ground-Water Hydrology. U.S. Geological Water Supply Paper 2220

conductivity value), and the result is multiplied by the entire thickness of the aquifer. The value of transmissivity determined by this method is too large (Heath, R.C.);

- If the zone supplying water to the well is thicker than the length of screen, or
- If the effective radius of the well is larger than the "nominal" radius (Heath, R.C., 1983)

The transmissivity based on specific capacity will be too small if a significant part of the drawdown in the pumping well is due to well loss (Heath, R.C., 1983). Figures 1 to 3 generally indicate that the hydraulic conductivity estimates calculated from specific capacity data are lower than those obtained from aquifer tests.

- c) *Concerning the analysis of an aquifer test in D-05-03 26ACC. Hydrology re-analyzed both the "constant rate" and recovery data for the tested well. Our analysis shows an average K-value of 14 ft/d. The K-values determined by ADWR are estimated by dividing the transmissivity value by the full saturated thickness of the well [depth of completed well (418 ft.) – static water level (128 ft.) = 290 ft]. It may be that the applicant is using the screened interval (200 ft) to estimate the K-value. This would account for their higher estimated values. The transmissivity value obtained from the results of an aquifer test should best represent the saturated thickness of the completed well and should not be just limited to the screened interval.*

*It is important to note that while the test is presented as a "constant rate" test, the plot of the drawdown curve clearly shows the test more closely resembles a "step test".*

*Finally, it is also important to note that after 24 hours, the well had not fully recovered. The maximum drawdown after 24 hours was 109 ft. However, after 24 hours of recovery, the water level had only risen 99 ft.*

**Response:** The updated AWC model currently has a hydraulic conductivity value in this area of 25 ft/d (see Figure 1). A Well Impact Analysis Recharge Well SRR-1, Red River Development, Pinal County (URS 2007<sup>5</sup>) report was obtained from the ADWR Imaged Records for this well (55-213913). A copy of the report is in Appendix B of the August 25, 2008 submittal. The well is constructed with two louvered screen sections: 160 to 240 ft. bgs, and 270 to 390 ft. bgs with a total screen length of 200 feet. The 24-hour constant rate aquifer test was conducted from February 19-20, 2007 at an average rate of about 225 gpm. A static water level of 127.65 ft. bgs

<sup>5</sup> URS November 19, 2007. Well Impact Analysis Recharge Well SRR-1, Red River Development, Pinal County, Arizona. Prepared for TOUSA Homes Inc.

was recorded prior to starting the test. A pumping water level of 237.78 ft. bgs was recorded at the end of the constant rate test (total drawdown = 110.13 ft). Water level recovery was monitored for 24 hours with an ending recovered depth to water of 138.82 ft. bgs, or about 90 percent recovery from the initial static water level. The Cooper-Jacob plot indicated a transmissivity of about 23,760 gpd/ft (3,176 ft<sup>2</sup>/d). Based on water production from the static water level to the bottom of the well (290 ft) results in a hydraulic conductivity value of about 10.95 ft/d. The Theis Recovery plot indicated a transmissivity of about 39,600 gpd/ft (5,294 ft<sup>2</sup>/d). Assuming water production from the static water level to the bottom of the well results in a hydraulic conductivity value of 18.25 ft/d. The average hydraulic conductivity is about 14.6 ft/d. The modeled hydraulic conductivity value of 25 ft/d at this location is generally in line with the average hydraulic conductivity value of the tested well (see Figure 1).

4) *Calibration Residuals:* Calibration residuals for the selected calibration years were summarized in Table 2 below. As shown in the table, the mean residual errors in Layer 1 for all the selected years are negative values, indicating that water levels at observation wells are under simulated. On the contrary, all the mean residual errors in Layer 2 are positive values, indicating that water levels are over simulated. Water levels in Layer 3 are mostly over simulated except for 2003 when they are largely under simulated. The residual error patterns suggest the need of additional model calibration effort.

The layer specific water budget usually provides useful information on how groundwater interacts among different layers. The layer specific water budgets for selected calibration years were summarized in Table 3 below. As indicated in Table 3 below, the dominant inflow component is recharge, and recharge is primarily applied to Layer 1. Even with the significantly increased agricultural recharge, layer 1 water levels were shown to be apparently under simulated. In Layers 2 and 3 where much less recharge was simulated, water levels were shown to be over simulated. The residual error pattern also suggests the possible presence of model errors on hydraulic parameters including the distribution of hydraulic conductivity and vertical conductance.

The residual error patterns noted above must be carefully examined and related to the overall effect that they have on the model.

Table 2 – Calibration Results per Layer as Calculated by the ADWR

Year	Layer 1			Layer 2			Layer3			All Layers		
	# of wells	ME	MAE	# of wells	ME	MAE	# of wells	ME	MAE	# of wells	ME	MAE
1985	59	-14.8	24.5	15	24.9	37.3	17	6.3	24.9	91	-4.3	26.7
1988	56	-16.7	33.4	43	50.1	61.9	17	11.2	26.7	116	12.2	43.0
1998	51	-27.9	51.9	38	19.9	40.9	18	1.3	35.1	107	-6	45.2
2003	46	-29.3	51.5	29	10.8	38.7	13	-20.6	41.9	88	-14.8	45.8

ME = Mean residual error; MAE = Mean Absolute Residual Error

Table 3 -- Layer Specific Water Budgets as Calculated by the ADWR

Layer Specific Budget Inflow Components	1985			1998		
	Layer 1	Layer 2	Layer 3	Layer 1	Layer 2	Layer 3
Storage	112,075	10,307	101,087	37,600	62	8,226
Top	-	314,529	148,426	-	247,977	120,829
Bottom	23,400	30,325	-	13,853	17,432	-
Constant Head	-	-	-	-	-	-
Wells	8,601	141	13,046	8,893	144	13,130
Recharge	614,880	15,496	80,435	470,145	13,293	79,072
GHB	28	-	21	-	-	-
<b>Subtotal</b>	<b>758,985</b>	<b>370,798</b>	<b>343,014</b>	<b>530,491</b>	<b>278,908</b>	<b>221,257</b>

Outflow Components						
Storage	293,907	43,713	62,919	175,512	33,390	45,361
Top	-	23,400	30,325	-	13,853	17,432
Bottom	314,529	148,426	-	247,977	120,829	-
Constant Head	-	-	-	-	-	-
Wells	149,412	155,246	240,966	102,310	110,823	136,471
GHB	1,128	-	8,783	4,683	-	22,007
<b>Subtotal</b>	<b>758,976</b>	<b>370,785</b>	<b>342,994</b>	<b>530,483</b>	<b>278,895</b>	<b>221,271</b>

**Response:** The revised AWC model included updates to the model pumping database to include SCIP pumping information provided by ADWR, revisions to model boundary conditions, and revisions to agricultural recharge rates. Calibration residuals for the revised AWC model for selected target calibration years are summarized in the Table 1 below:

Table 1 - - Calibration Results by Layer

Year	Layer 1			Layer 2			Layer 3			All Model Layers		
	# Obs. Wells	ME (ft)	MAE (ft)	# Obs. Wells	ME (ft)	MAE (ft)	# Obs. Wells	ME (ft)	MAE (ft)	# Obs. Wells	ME (ft)	MAE (ft)
1985	56	(-5.9)	24.9	14	(-20.4)	37.3	16	(-8.3)	23.4	85	(-8.9)	26.8
1988	60	(-0.8)	36.7	37	20.5	44.9	18	3.09	34.2	113	5.78	38.6
1998	57	(-11.7)	37.0	32	(-10.2)	35.0	19	(-2.2)	28.6	107	(-9.4)	34.9
2003	51	(-21.4)	36.0	23	(-10.6)	30.6	15	(-12.9)	29.8	89	(-17.2)	33.6
Mean		(-9.9)	33.6		(-5.2)	37		(-5.1)	29		(-7.4)	33.5
Mean (08/2008 Model)		(-22.2)	40.3		26.4	44.7		(-0.5)	32.2		(-3.2)	40.2

The table above indicates that water levels in model layer 1 are still under-simulated but not as significantly as the previous version of the model. Water levels in model layers 2 and 3 are slightly under-simulated, however layer 2 is improved in comparison to the previous simulation.

Table 2 below summarizes model statistics for the updated AWC model:

Table 2 - - Summary of Model Statistics

Parameter	Year			
	1985	1988	1998	2003
Number of Observation Points	85	113	107	89
Mean Error (ME)	-8.9 ft.	5.78 ft.	-9.4 ft.	-17.2 ft.
Mean Absolute Error (MAE)	26.8 ft.	38.6 ft.	34.9 ft.	33.6 ft.
Root Mean Squared (RMS)	33.8 ft.	48.6 ft.	42.9 ft.	42.6 ft.
Normalized Root Mean Squared Error (%RMS)	3.66%	5.39%	5.02%	4.9%
Correlation Coefficient (R)	0.99	0.97	0.98	0.98

The table (Table 2) above documents all model statistics comparing target water levels with model simulated levels. Based on these data, an overall root mean square error of 4.74 percent was calculated, which indicates a reasonably good match between model simulated and measured heads, overall. This error rate is consistent with ASTM and locally accepted standards, and is better than the 10 percent RMS error outlined in Spitz and Moreno (1996<sup>6</sup>).

<sup>6</sup> Spitz, K., and Moreno, J., 1996. A Practical Guide to Groundwater and Solute Transport Modeling: John Wiley & Sons, Inc., New York, 461 p.

Table 3 -- Layer Specific Water Budget, AWC Revised Model

	1985			1998		
	Layer 1	Layer 2	Layer 3	Layer 1	Layer 2	Layer 3
<b>INFLOW</b>						
Storage	151,782	16,269	85,234	72,767	6,514	11,215
Wells	13,239	5,918	31,104	12,664	5,999	30,000
Recharge	676,188	20,259	80,540	469,079	4,843	58,372
Layer 2 to 1	19,186			8,827		
Layer 1 to 2		531,588			461,261	
Layer 3 to 2		41,380			20,673	
Layer 2 to 3			151,824			156,734
<b>Total In</b>	<b>860,395</b>	<b>615,414</b>	<b>348,701</b>	<b>563,337</b>	<b>499,290</b>	<b>256,321</b>
<b>OUTFLOW</b>						
Storage	306,069	152,511	56,984	76,737	74,957	48,174
Wells	22,737	291,899	250,347	25,346	256,753	187,461
Layer 1 to 2	531,588			461,261		
Layer 2 to 1		19,186			8,827	
Layer 2 to 3		151,824			156,734	
Layer 3 to 2			41,380			20,673
<b>Total Out</b>	<b>860,394</b>	<b>615,420</b>	<b>348,711</b>	<b>563,343</b>	<b>499,286</b>	<b>256,308</b>

A layer specific water budget was prepared (Table 3) for years 1985 and 1998. As indicated in Table 3, most of the recharge is still applied to model layer 1 as it is the uppermost active layer throughout much of the model domain. Table 3 illustrates that inflow from model layer 1 to layer 2 has increased significantly which has improved the under simulation observed in layer 2. The overall mean error in model layer 2 has improved by about 21 ft (Table 1).

5) Observed vs. Model Simulated Water Elevation Contours: In 2003, the model simulated groundwater elevation contours are significantly different from the observed ones, especially in the Maricopa Stanfield sub-basin, where the difference could be as much as 250 ft. The applicant must address the error within the model calibration or re-conceptualization.

**Response:** The 2003 measured water level contours presented on Figures 15 and 16 of the August 2008 submittal are from ADWR HMS #36. The measured water level contours presented in ADWR HMS#36 represent a composite water level as water levels of the upper aquifer and lower aquifer were not broken out separately. The middle confining unit separates the aquifer system into upper and lower aquifer systems (Pool and others 2001). The upper and lower

aquifer systems are poorly connected hydraulically where the middle confining unit separates the two aquifer systems (Pool and others, 2001). Head differences between the upper and lower aquifers in the Maricopa-Stanfield sub-basin may be as much as 302 feet as observed in wells D-06-04 09DDD1 and D-06-04 09DDD2 (ADWR HMS #36 Hydrograph No. 35). Head differences between the upper and lower aquifers in the Eloy sub-basin may be as much as 122 feet as observed in wells D-09-08 20ADD1 and D-09-08 20ADD2 (ADWR HMS #36 Hydrograph No. 86). To illustrate the current calibration of the revised AWC model residual error maps for 2003 for all model layers are illustrated on Figures 4 to 6. Figure 4 illustrates a minimum residual of -84.7 ft, and a maximum residual of 134.3 ft for model layer 1 in 2003 (mean residual error = -21.4 ft). Figure 5 illustrates a minimum residual of -102.1 ft, and a maximum residual of 56.1 ft for model layer 2 in 2003 (mean residual error = -10.6 ft). Figure 6 illustrates a minimum residual of -86.6 ft, and a maximum residual of 46.1 ft for model layer 3 in 2003 (mean residual error = -12.9 ft).

We do not believe that the model calibration can be further improved. The observed head data is often from wells that may screen more than one aquifer. Because there is a large vertical difference in head established in this basin, head measurement errors will be large and related to the well construction. A 3-layer model will simply not be able to accommodate such large head differences on a well-by-well basis. The overall statistical analysis of calibration indicates the revised AWC model adequately simulates head differences observed in the Eloy and Maricopa-Stanfield sub-basins.

*6) Inactive Section of Layer 3: In the central Eloy sub-basin, due to the large thickness of Layers 2 and 3, the bottom of the model exceeds 3,000 ft. As a result, Layer 3 in this area was determined to be inactive in the revised AWC model. The Layer 3 thickness in the area could be as much as 2,000 ft. The extent and the location of the inactive portion of the model could potentially distort the groundwater flow direction in this area. A recommended alternative method would be to simulate the Layer 3 in this area through a thin layer (50 ft or 100 ft in thickness) with fudged conductivity values to maintain the realistic transmissivity values in this area.*

**Response:** Model Layer 3 cells in the central Eloy sub-basin have been converted from inactive to active cells where the bottom of the model exceed 3,000 ft bls. The bottom elevation of model layer 3 was re-imported to the model with a minimum layer thickness of 100 feet. Where model layer 3 is less than about 200 ft. thick in the central Eloy sub-basin the hydraulic conductivity was set to 100 ft/d to "artificially" maintain a transmissivity of about 10,000 ft<sup>2</sup>/d (based on an assumed layer thickness of about 2,000 ft.).

7) Sensitivity Analysis: The report includes a table summarizing the model sensitivity results with regard to hydraulic parameters of conductivity, specific storage and specific yield. As shown in this table, the model is most sensitive to the reduced values of specific yield, and relatively sensitive to hydraulic conductivity, and generally insensitive to changes in specific storage. Since the sensitivity results were evaluated by comparison of the sum of the squared residuals to the transient calibrations, the lack of calibration targets in Layer 2 and 3 especially in the area where thick clay layer exists could partially skew the conclusions regarding the model's insensitivity to changes on specific storage.

Due to the lack of details, it is not clear how the sensitivity analysis was performed. Since each hydraulic parameter tested (i.e. conductivity, specific yield, and specific storage) has many zones in different model layers, it is not clear if one zone of each parameter was tested or all the zones of each parameter were tested simultaneously. The applicant must provide greater detail of how the sensitivity analysis was performed.

**Response:** The sensitivity analysis of hydraulic conductivity, specific storage, and specific yield presented in the August 2008 submittal was not zone specific. The range of values above and below each selected model parameter for the sensitivity analysis was applied model-wide.

8) Rewetting Function: The rewetting function is not activated in the revised AWC model. As groundwater levels in the Pinal AMA have been observed to recover rapidly since the 1980s due to the use of CAP water and accordingly reduced groundwater pumpage. The activation of the rewetting function in MODFLOW could, in theory, help to better simulate groundwater conditions in the Pinal AMA. It is understood that the rewetting function might not work as well as expected some time; however, the applicant must include a discussion of this function in the report.

**Response:** The original USGS MODFLOW did not allow cells in unconfined layers to become re-saturated if the head dropped below the bottom elevation of the grid cells during the course of the simulation. Model cells that went dry during the simulation became inactive for the remainder of the simulation. The USGS later revised the Block-Centered-Flow Package (BCF2) to allow re-wetting of dry cells during a transient simulation. Incorporation of the re-wetting function may cause the solution to become more unstable. The revised AWC model has now incorporated the re-wetting function. The re-wetting function is currently set with a wetting method of re-saturating cells from below, and a wetting interval of every 4 iterations.

An electronic copy of revised AWC transient model (1984 – 2007) is included on a CD in Attachment A.



Mr. John Schneeman  
ADWR  
April 2009  
Page 12

If you have any questions regarding any of the information presented in this letter please contact me at 480-659-7131.

Sincerely,

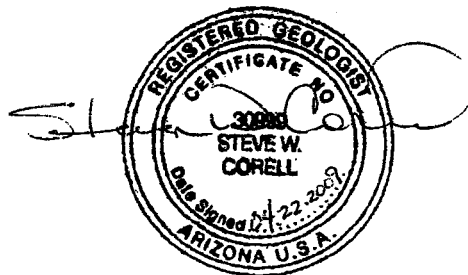
CLEAR CREEK ASSOCIATES, PLC

A handwritten signature in black ink, appearing to read "Steven W. Corell".

Steven W. Corell, R.G.  
Senior Hydrogeologist

Attachments

cc: Bill Garfield, Arizona Water Company  
Tom Harrell, Arizona Water Company  
Doug Bartlett, Clear Creek Associates

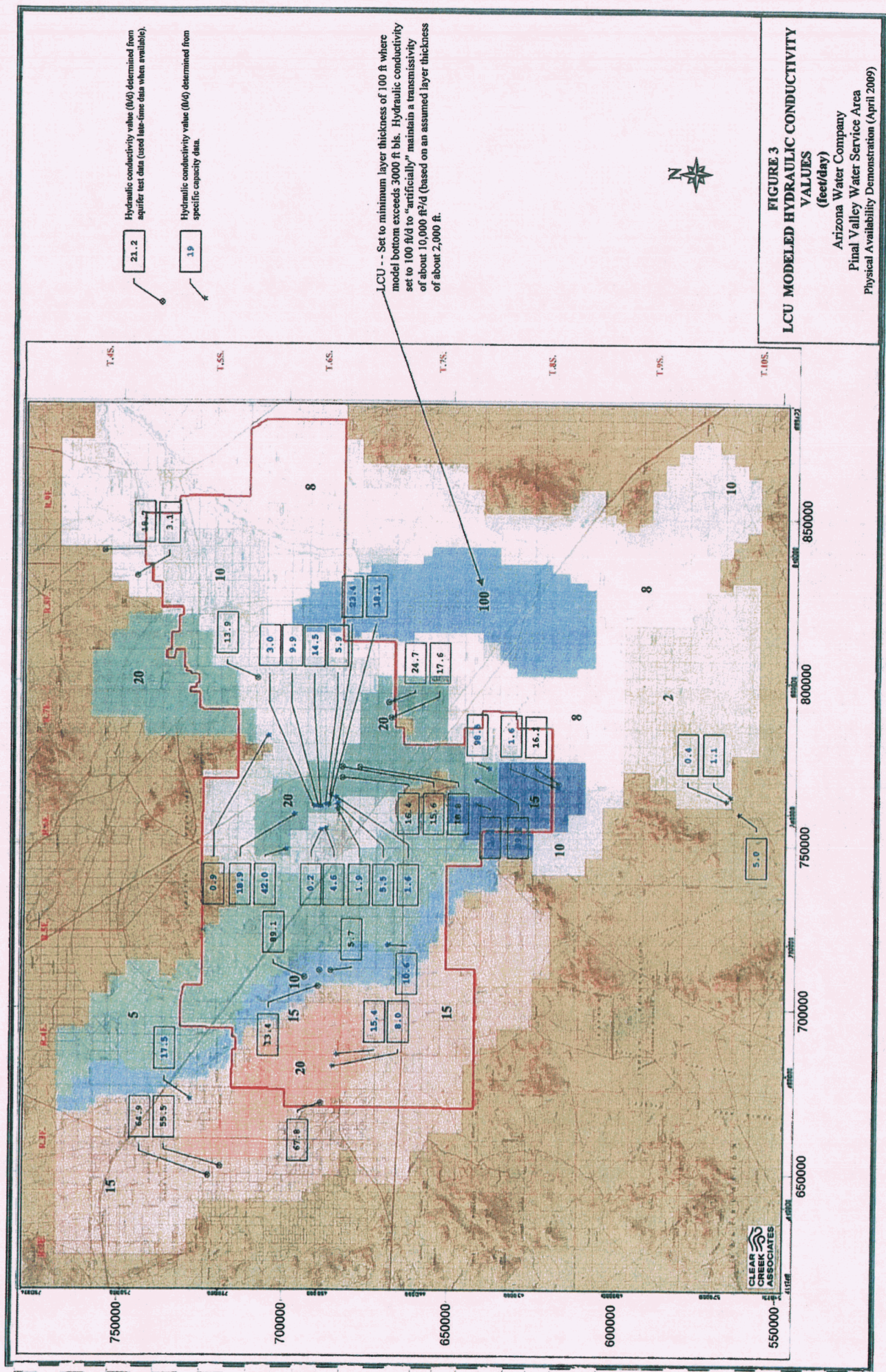


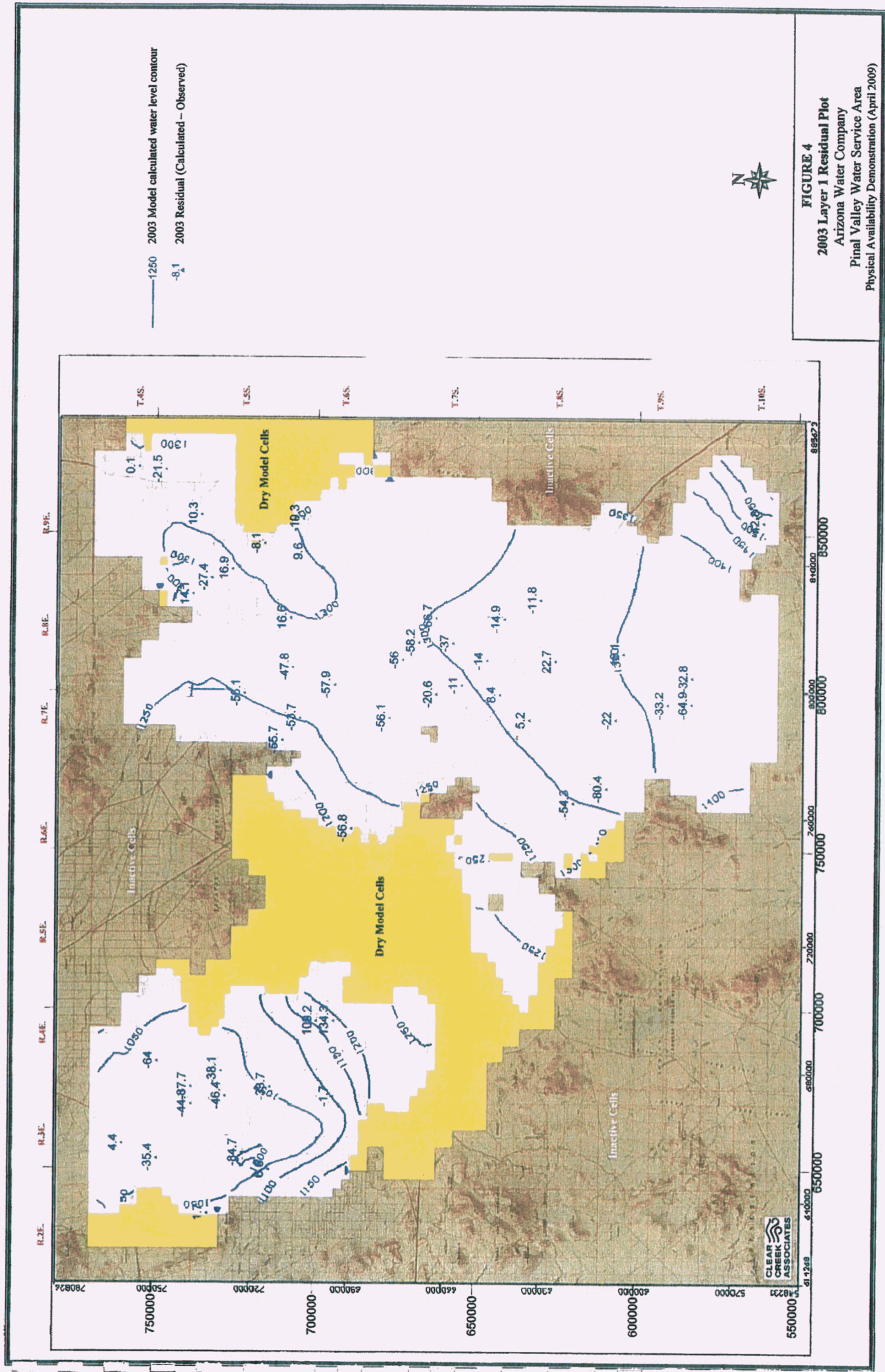
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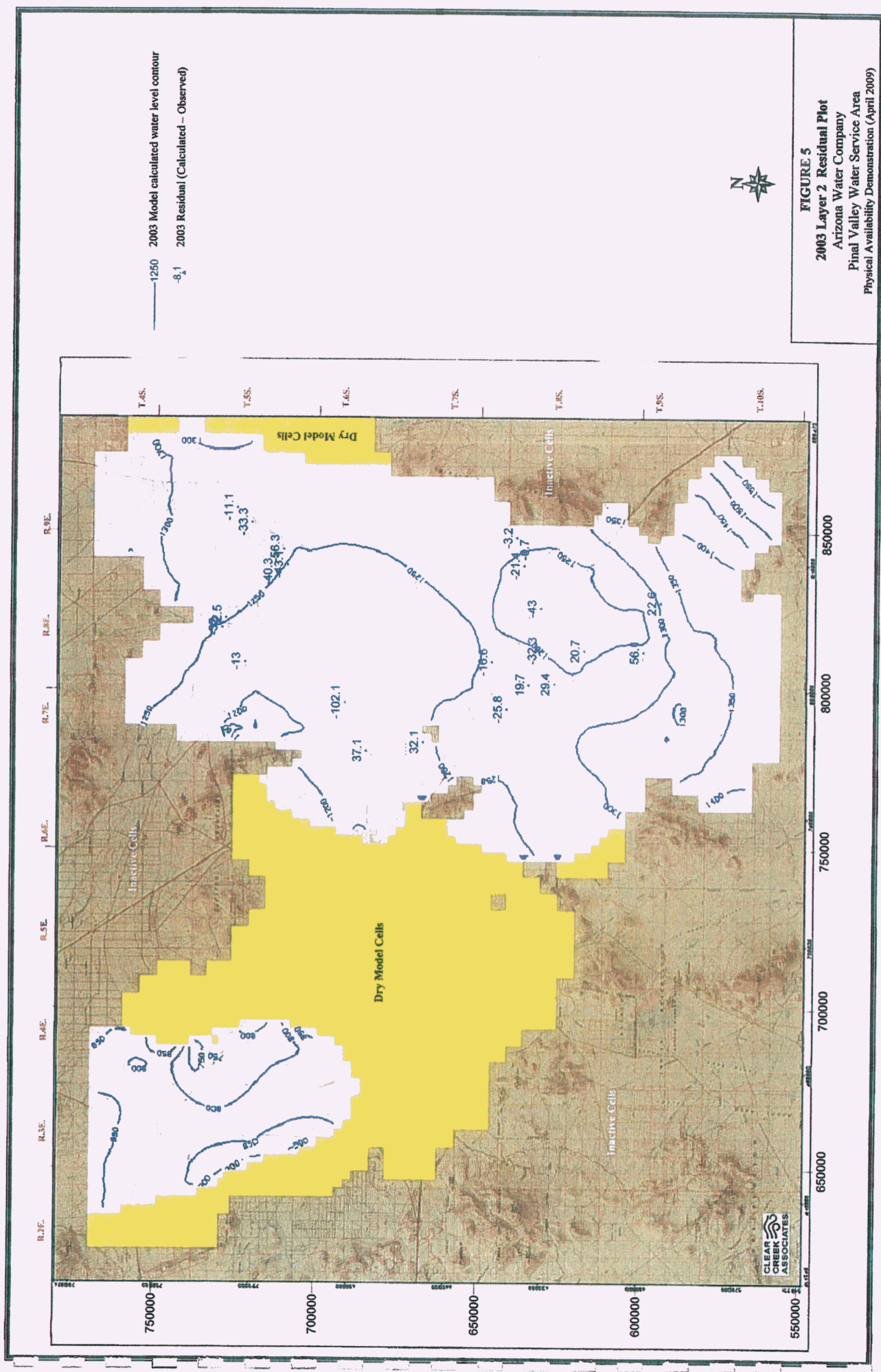
## FIGURES











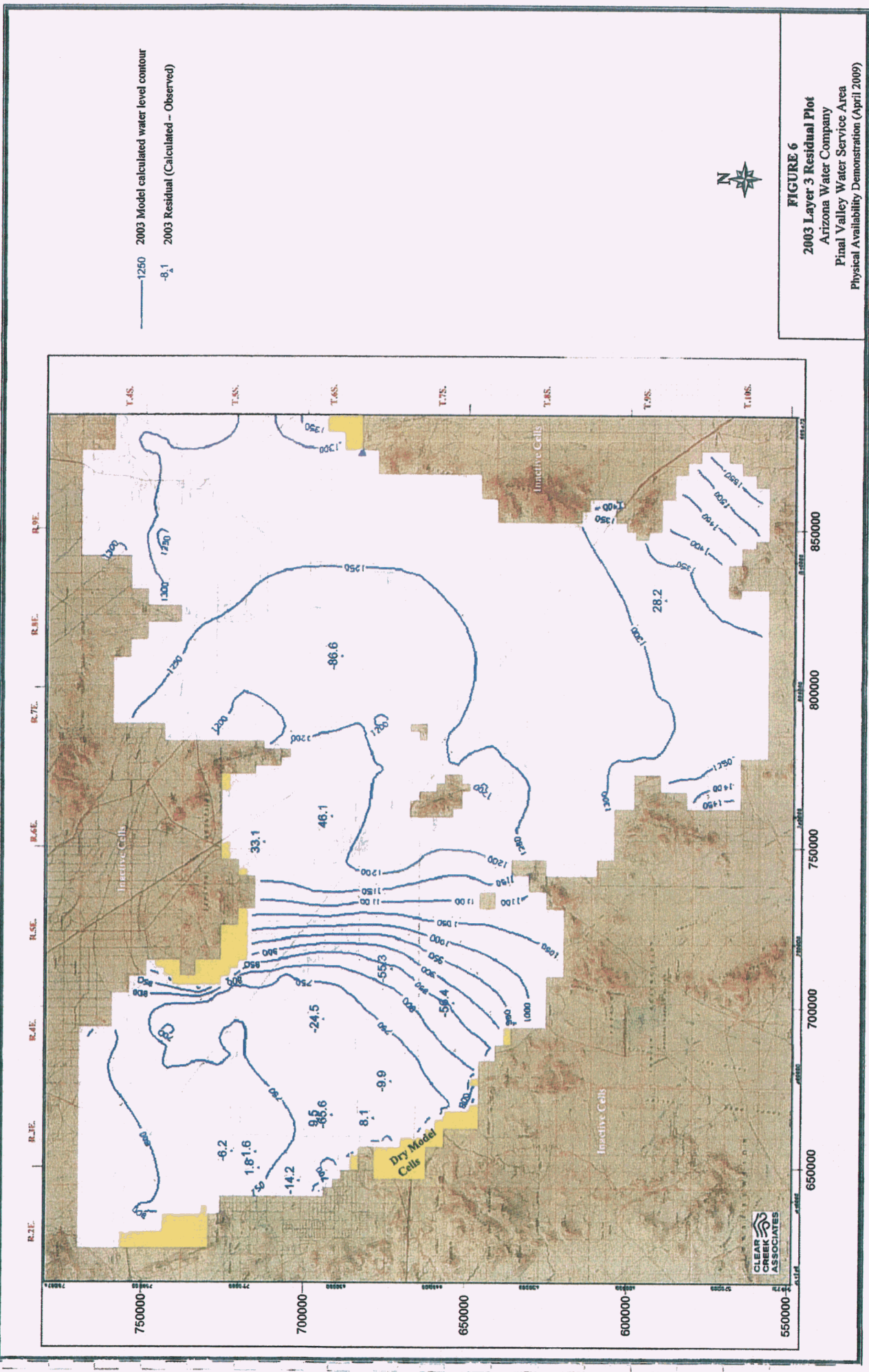


FIGURE 6

2003 Layer 3 Residual Plot  
Arizona Water Company  
Pinal Valley Water Service Area  
Physical Availability Demonstration (April 2009)

CLEAR CREEK ASSOCIATES





Practical Solutions  
in Groundwater Science



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September 3, 2009

Mr. John Schneeman, Manager  
ADWR/ Office of Assured & Adequate Water Supply  
3550 N. Central Avenue  
Phoenix, Arizona 85007

**Re: Response to Administrative Completeness Review (dated November 20, 2008),  
Application for a Physical Availability Demonstration Item No. 9, Arizona Water Company  
-- Pinal Valley Water Service Area (ADWR File No. 51-700444.0000)**

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Dear Mr. Schneeman:

This letter has been prepared by Clear Creek Associates, PLC (CCA) on behalf of Arizona Water Company to respond to item no. 9 in the ADWR's Administrative Completeness Review letter dated November 20, 2008, for the subject PAD application. The Department's letter has been discussed in meetings with Department staff on December 16, 2008, and March 6, 2009. This letter response also incorporates issues discussed in a meeting with Department staff on May 28, 2009. The comments presented in the Department's Administrative Completeness Review letter are presented below in italics followed by our response.

**9) General Concerns**

- a) *The AWC updated total committed demand volume for the Maricopa-Stanfield sub-basin is acceptable. The CCA response states that Tables 14 and 15 summarize the (non-AWC) current and committed water demand simulated in the model and include well locations for the Maricopa-Stanfield and Eloy sub-basins. However, the attached tables in the response did not reflect this revised information and must be updated with the correct demand values and well locations.*

**Response:** Table 1 summarizes current and committed demand simulated in the Maricopa-Stanfield sub-basin and includes the well locations simulated in the model. The total non-Arizona Water Company (AWC) current and committed demand is 46,632 acre-feet/year (AFY) in the Maricopa-Stanfield sub-basin. Table 1 includes a revised demand for the Thunderbird Farms Improvement District of 1,092 AFY as suggested by Department staff in a meeting held on May 28, 2009. Table 2 summarizes the current and committed demand simulated in the Eloy

sub-basin including the well locations. The total non-AWC current and committed demand is 88,121 AFY in the Eloy sub-basin.

- b.) *There is a groundwater pumping deficit of around 60,000 af/yr simulated in the model versus the pumping volume the Department estimates should be in the model. The deficit appears to be due to the non-inclusion of Indian (SCIP and GRIC) pumping and a volume of long-term storage credits (LTSC) that are too low. However, the deficit may also be caused by model cells dewatering that contain projected pumpage. The deficit remains fairly steady to around 2020 and then starts growing to a high of around 117,000 af/yr in 2057. Due to the removal of LTSC, the deficit drops to around 85,000 af/yr and remains at this volume to 2107. Overall, the volume simulated in the model is ~8.8 million acre-feet short of what was projected by ADWR (60,095,147 vs. 69,918,698 projected). This must be addressed by the applicant.*

**Response:** After completing the revised Arizona Water Company (AWC) transient model (1984 to 2007) the model was set-up to run 100-year projections.

*Model Boundary Conditions for the 100-Year Simulation*

Model boundary conditions are the same as the AWC transient model with the exception of the following;

- Gila River recharge; assumed 7,450 AFY (1984 to 2005 median value)
- Santa Cruz River recharge; assumed 11,656 AFY (1984 to 2005 median value)
- Picacho Reservoir recharge; assumed 4,845 AFY (1984 to 2005 median value)
- South Picacho constant-flux boundary; assumed 18,000 AFY to year 2030, and 13,000 AFY to year 2107 (ADWR Tucson AMA model results as discussed in our meeting with Department staff on March 6, 2009)

*Groundwater Pumping for the 100-Year Simulation*

The Department provided a spreadsheet (Master Demand Spreadsheet 6-22-09.xls, provided by Steve Rascona, ADWR) with estimates of future pumping that were incorporated into the model pumping database. The Departments estimate of future pumping also accounted for some conversion of agricultural wells to municipal supply wells. The future pumping estimate also accounts for long-term storage credits by increases in groundwater pumping for the Maricopa-Stanfield Irrigation and Drainage District (MSIDD), the Central Arizona Irrigation and Drainage District (CAIDD), and the Hohokam Irrigation District (HID) over a period of 50-years. Total estimates of pumping for the 100-year simulation are summarized in Table 3.

#### *Agricultural Recharge for the 100-Year Simulation*

Estimates of agricultural recharge for the 100-year simulation assumed a 35 percent irrigation efficiency based on the 100-year pumping estimates for MSIDD, CAIDD, HID, and Non-District (Table 3). Agricultural recharge estimates for the Ak-Chin community were based on the average CAP deliveries from 1988 to 2005 and an irrigation efficiency of 35 percent. Agricultural recharge estimates for the SCIDD is the average value from 1984 to 2000, this method was applied to the SCIDD due to the large component of surface water delivery and large main canal and lateral losses. The agricultural recharge estimates for the 100-year simulation are summarized in Table 4.

#### *Reducing the Groundwater Pumping Deficit*

In an effort to reduce the pumping deficit caused by cell de-watering, numerous 100-year model projections were run. Model pumping that was being lost due to cell de-watering was allocated to lower model layers and in some cases wells were moved to adjacent cells to reduce cell de-watering. The total conceptual pumping for the 100-year simulation is 77,228,538 AF (this total excludes groundwater pumping simulating underflow); the final 100-year projection run simulated 76,078,131 AF. The total model deficit for the 100-year simulation is ~1,150,000 AF (~11,500 AFY). Model pumping deficits range from about -200 AF to -36,000 AF at the end of the simulation (Table 5). The updated 100-year projection simulates 98.5% of the total pumping (simulated vs. conceptual). The majority of "lost" pumping is located along the margins of the Maricopa-Stanfield sub-basin, near the Casa Grande and Sacaton Mountains, and areas north of Coolidge and Florence. Model cell de-watering is a result of high pumping rates, in some cases numerous pumping wells in one model cell, and model boundary conditions such as near sub-basin margins with decreasing depth-to-bedrock. Table 5 presents a summary of the 100-year pumping analysis.

#### *Evaluation of Groundwater Supply Availability*

The 100-year predictive simulation was run to determine the available groundwater supply for the Arizona Water Company Pinal Valley Water Service Area (PVWSA) in meeting the current, committed, and projected water demands. The predictive simulation includes 141,419 AFY of non-Arizona Water Company current and committed demand. The predictive model simulates groundwater pumping from the Company's existing service area wells, and from 183 "new" wells projected to be located within the PVWSA system. In reality, as the service area population grows, many of the "new" wells will not be new wells but rather replacement wells for agricultural wells that are no longer needed for irrigation or converted agricultural wells. Table 6

summarizes the well locations and pumping rates for the existing and "new" wells for the 100-year model simulation. The modeled "new" wells were located based on criteria that included: location in relation to the current and planned water transmission system, location in relation to the most productive areas of the aquifer, and in an effort to locate wells away from known areas of severe water level drawdown. The predictive simulation includes a demand of 120,000 AF/yr for the AWC PVWSA beginning in year 2036. The following pumping schedule was applied to the Arizona Water Company wells:

▪ 2008	17,153 AF
▪ 2009-2015	25,000 AF/yr
▪ 2016-2020	45,000 AF/yr
▪ 2021-2025	55,000 AF/yr
▪ 2026-2030	75,500 AF/yr
▪ 2031-2035	110,000 AF/yr
▪ 2036-2108	120,000 AF/yr

The estimated water demand for the AWC - Pinal Valley Water Service Area of 120,000 AFY was simulated in MODFLOW's Well Package. Ending model calculated heads from the 1984 to 2007 transient simulation served as the starting heads for the 100-year simulation. The model calculated 100-year groundwater elevation contours for model layers 2 and 3 (the MSCU and LCU) are shown on Figures 1 and 2. The model calculated 100-year drawdown for layers 2 and 3 are shown on Figures 3 and 4. The depth-to-bedrock and model predicted 100-year depth-to-groundwater for model layers 2 and 3 are shown on Figures 5 to 8. The 100 year depth-to-groundwater contours were corrected to 2003 measured water level contours by subtracting the model calculated drawdown from the 2003 measured groundwater contours, and then subtracting the corrected 100-year groundwater elevation from the land surface elevation. This was done to reduce the influence of model error.

Figure 5 indicates a 100-year depth-to-water for model layer 2 ranging from about 500 to 900 feet across the western portion of the PVWSA, and about 200 to 800 feet across the eastern portion of the PVWSA. Figure 6 shows the layer 2 100-year depth-to-water contours overlain with the depth-to-bedrock contours. Figure 7 indicates a 100-year depth-to-water for model layer 3 ranging from about 300 to 900 feet across the PVWSA. Figure 8 shows the layer 3 100-year depth-to-water contours overlain with the depth-to-bedrock contours. Predictive groundwater model results indicate a 100-year depth-to-water that is above the Pinal AMA limit of 1,100 feet depth-to-groundwater limit established for water providers in the Pinal AMA by ADWR Rule R012-15-703. A MODFLOW Zonebudget analysis (Table 7) for model cells simulating future Arizona Water Company pumping indicates the full 120,000 ac-ft/year is being simulated in the last model stress period. Table 7 also summarizes a MODFLOW ZoneBudget analysis of other current and committed demands which indicates full simulation.

*Summary*

Clear Creek Associates groundwater modeling results support the physical demonstration of the projected groundwater water demands through the year 2107 for the AWC – Pinal Valley Water Service Area of 120,000 ac-ft/yr. Predicted groundwater model results are conservative based on the following model assumptions:

- The predictive model incorporates Department provided estimates of future pumping of nearly 78 million acre-feet (Table 3).
- Model results are conservative as a majority of the 125,745 acres of agricultural land within AWC's Pinal Valley Water Service area will likely be urbanized over the next 100 years and the associated groundwater demands will cease.
- The predictive model accounts for the pumping of nearly 1,611,600 ac-ft of accrued long-term storage credits in the Pinal AMA over a 50-year period.
- All non-AWC committed demands (about 141,419 AFY) are simulated as being pumped in the final predictive simulation year (Table 7).
- The predictive simulation does not account for CAGRDR replenishment (recharge) in the Pinal AMA of groundwater pumped by its members which exceeds the pumping limitations imposed by the Assured Water Supply Rules.

The model predicted depth-to-water does not exceed the 1,100-foot limit for the AWC – PVWSA. Results of the groundwater modeling study support that groundwater is physically, legally (subject to the appropriate conversion of IGFRs to M&I use), and continuously available for 100 years. The electronic Visual MODFLOW datasets for the 100-year simulation are provided on CD in Appendix A.

- a) *Based on recognition that there is a significant pumping deficit in the model it is not possible to determine at this time whether there will be projected negative impacts (dewatering of projected Assured Water Supply (AWS) groundwater withdrawal locations or projected 100-year depths to static water that exceed 1,100 feet) for holders of issued AWS certificates, designations, or analyses in the model area. Once the deficit pumping issues are suitably addressed it will be necessary for the applicant to determine if negative impacts are projected for any issued AWS permit holders, and if so, modify the projected 100-year AWC groundwater demands to mitigate any such potential negative impacts.*

**Response:** The current 100-year predictive simulation accounts for about 98.5% of total pumping (simulated vs. conceptual). Lost pumping from model layer 2 includes areas of the eastern Maricopa-Stanfield sub-basin, near the Sacaton Mountains, and areas north of Coolidge and Florence (Figures 3 and 5). Lost pumping from model layer 3 includes areas along the margins of the Maricopa-Stanfield sub-basin, near the Casa Grande and Sacaton Mountains, and areas north of Coolidge and Florence (Figures 4 and 7). Model cell de-watering is from a combination of factors which may include; high pumping rates, numerous pumping wells in one model cell, and boundary conditions such as decreasing depth-to-bedrock along basin margins. A ZoneBudget analysis of the current and committed demand pumping is presented in Table 7 which indicates that 100% of the current and committed demand is simulated. Figures 5 and 7 show that the 100-year depth to static water does not exceed 1,100 feet, therefore no negative impacts are projected for current AWS permit holders.

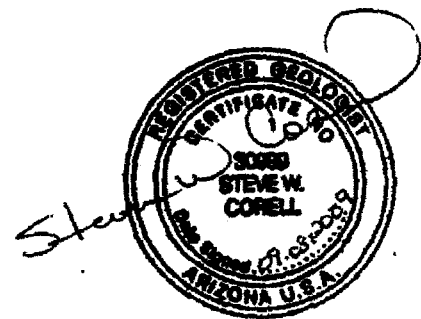
If you have any questions regarding any of the information presented in this letter please contact me at 480-659-7131.

Sincerely,

**CLEAR CREEK ASSOCIATES, PLC**

Steven W. Corell, R.G.  
Senior Hydrogeologist

cc: Bill Garfield, Arizona Water Company  
Tom Harrell, Arizona Water Company  
Doug Bartlett, Clear Creek Associates



Expires: 03-31-2012.

**Figures**

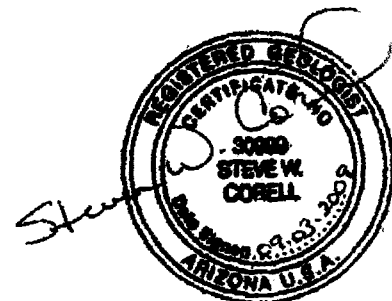
1. 100-year Groundwater Elevation Model Layer 2
2. 100-year Groundwater Elevation Model Layer 3
3. 100-year Drawdown Model Layer 2
4. 100-year Drawdown Model Layer 3
5. 100-year Depth-to-Water Model Layer 2
6. Depth-to-Bedrock & 100-year Depth-to-Water Model Layer 2
7. 100-year Depth-to-Water Model Layer 3
8. Depth-to-Bedrock & 100-year Depth-to-Water Model Layer 3

**Tables**

1. Maricopa-Stanfield Sub-basin - - Current & Committed Demand Pumping
2. Eloy Sub-basin - - Current & Committed Demand Pumping
3. 100-year Pumping Estimate for Arizona Water Company Pinal Model
4. Agricultural Recharge Estimate for 100-Year Simulation
5. 100-Year Pumping Analysis - - Conceptual vs. Modeled
6. Wells Used to Simulate Arizona Water Company Demand
7. ZoneBudget Analysis of Current & Committed Demand

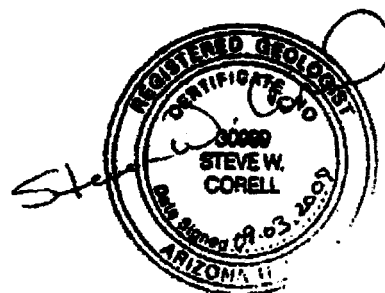
**Appendices**

- A. Groundwater Model Files for 100-year Projection (on CD)



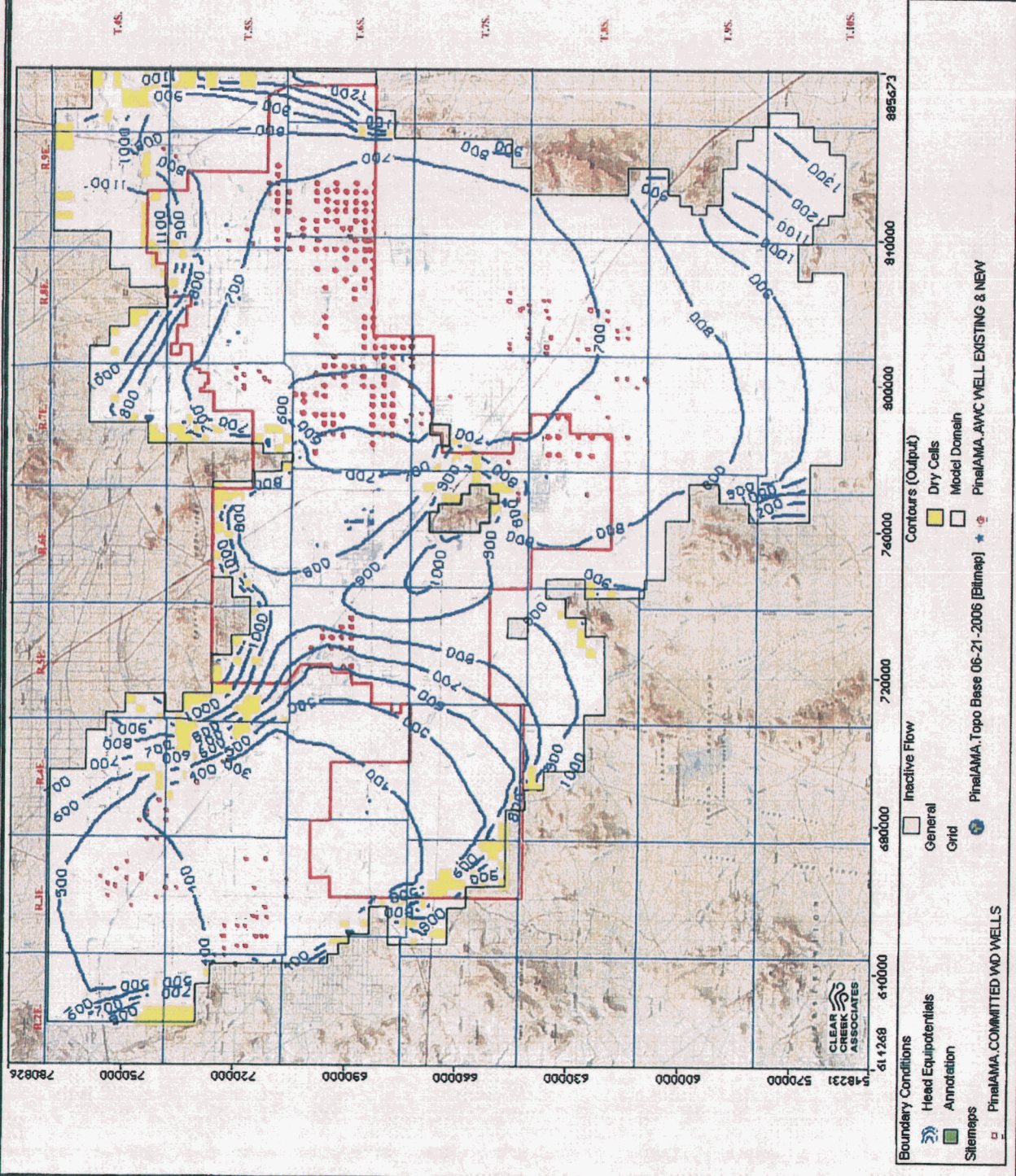
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## FIGURES

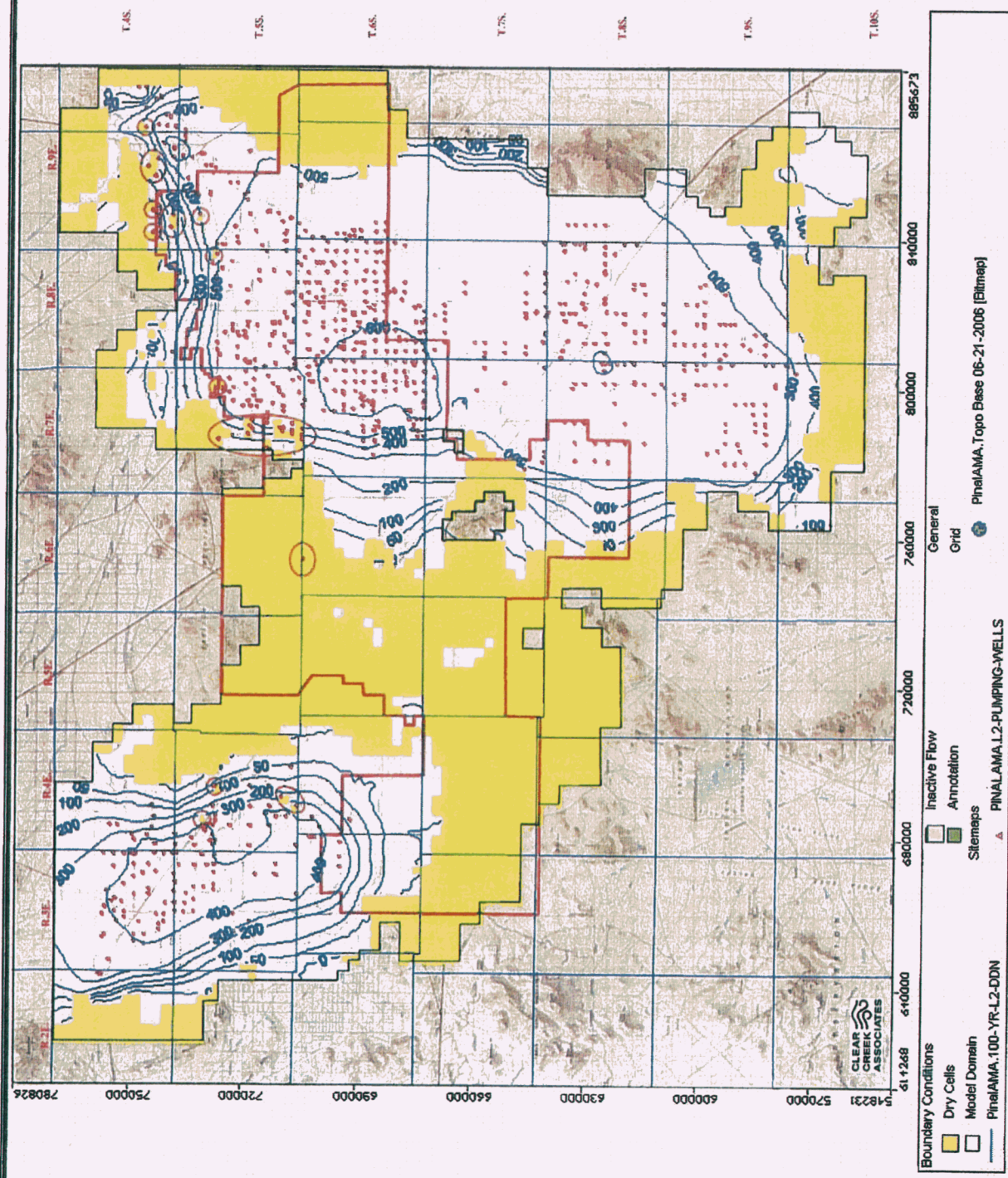


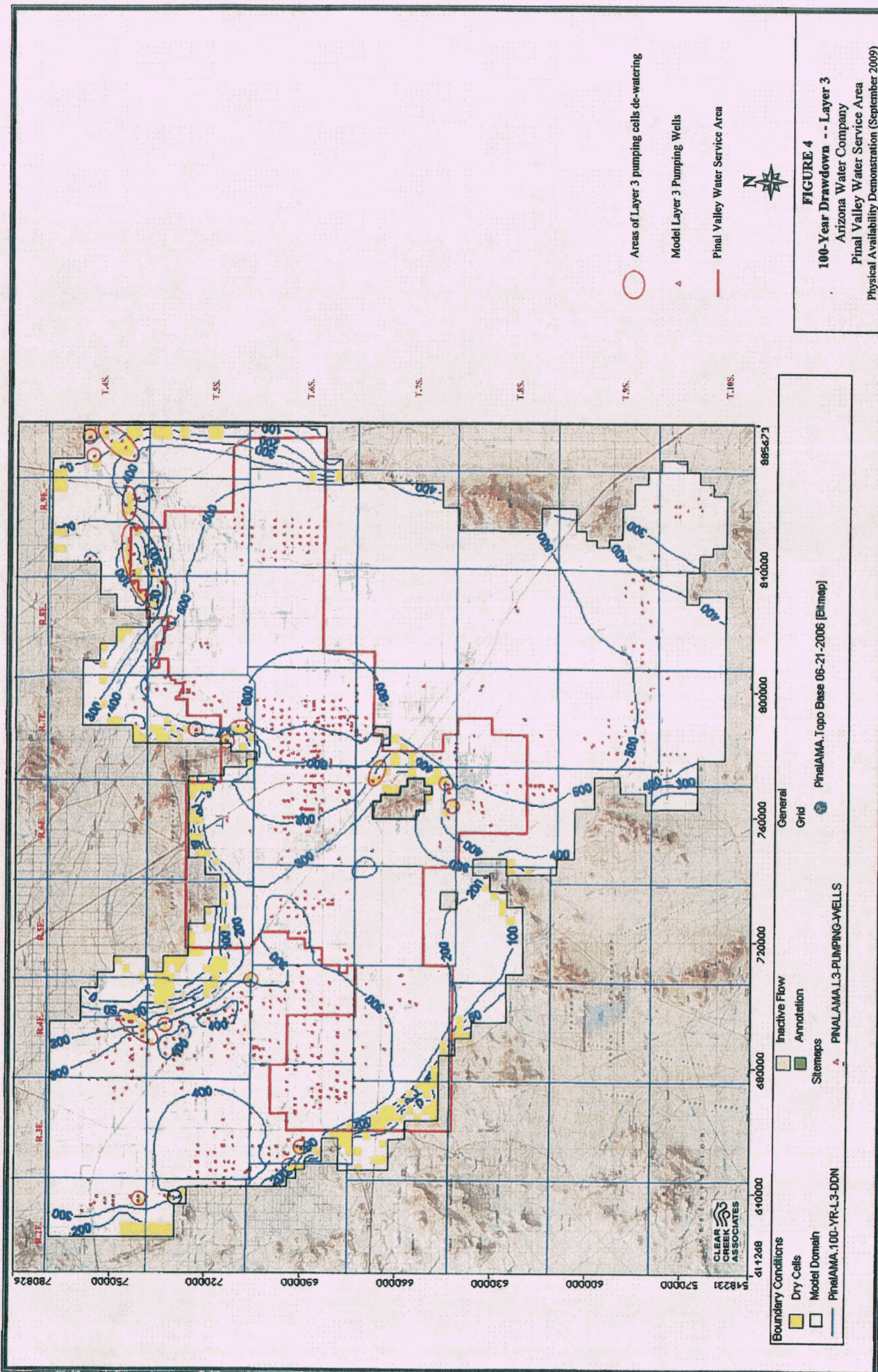
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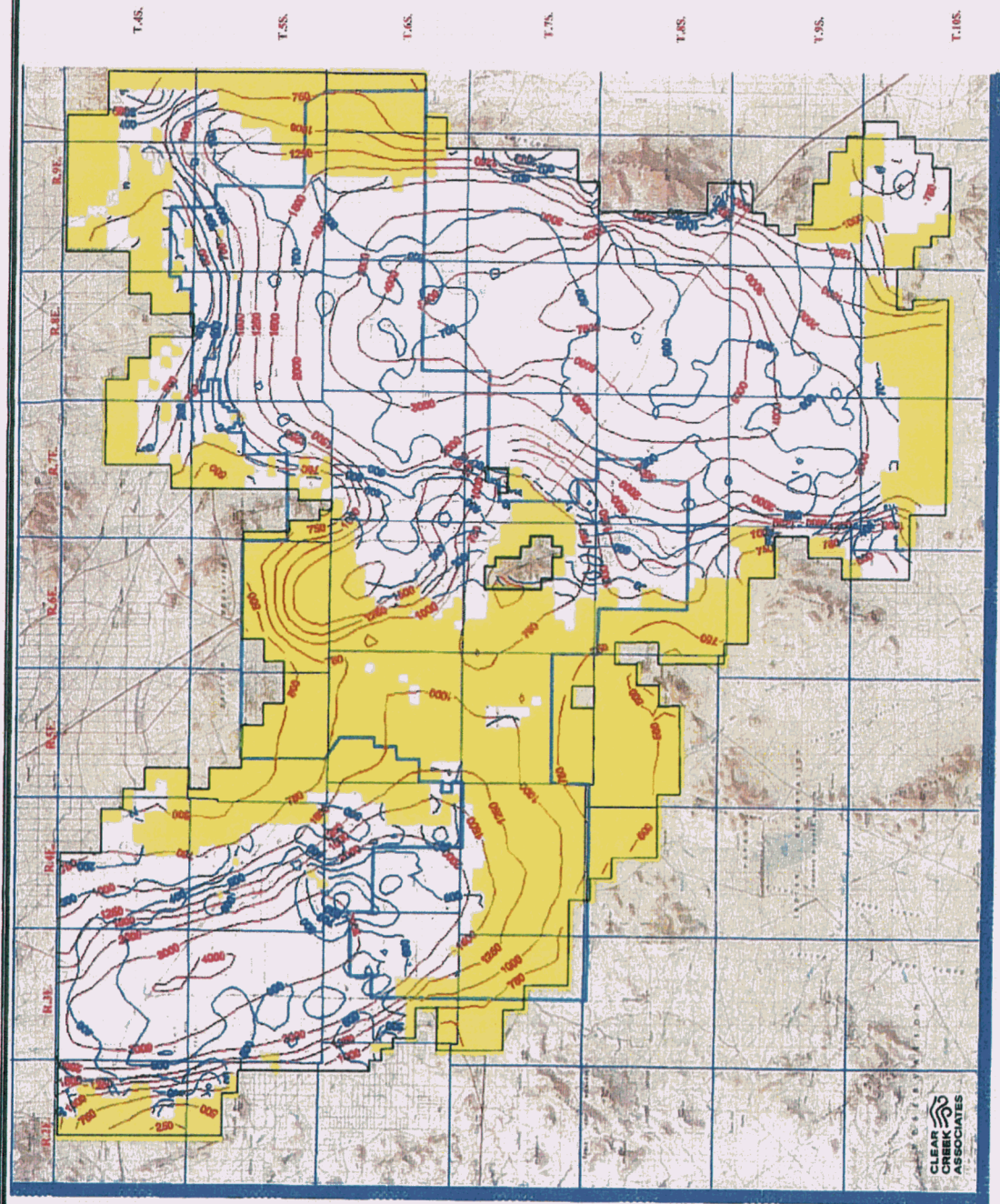
**FIGURE 1**  
**100-Year Groundwater Elevation - - Layer 2**  
Arizona Water Company  
Pinal Valley Water Service Area  
Physical Availability Demonstration (September 2009)



**FIGURE 2**  
**100-Year Groundwater Elevation - Layer 3**  
 Arizona Water Company  
 Pinal Valley Water Service Area  
 Physical Availability Demonstration (September 2009)







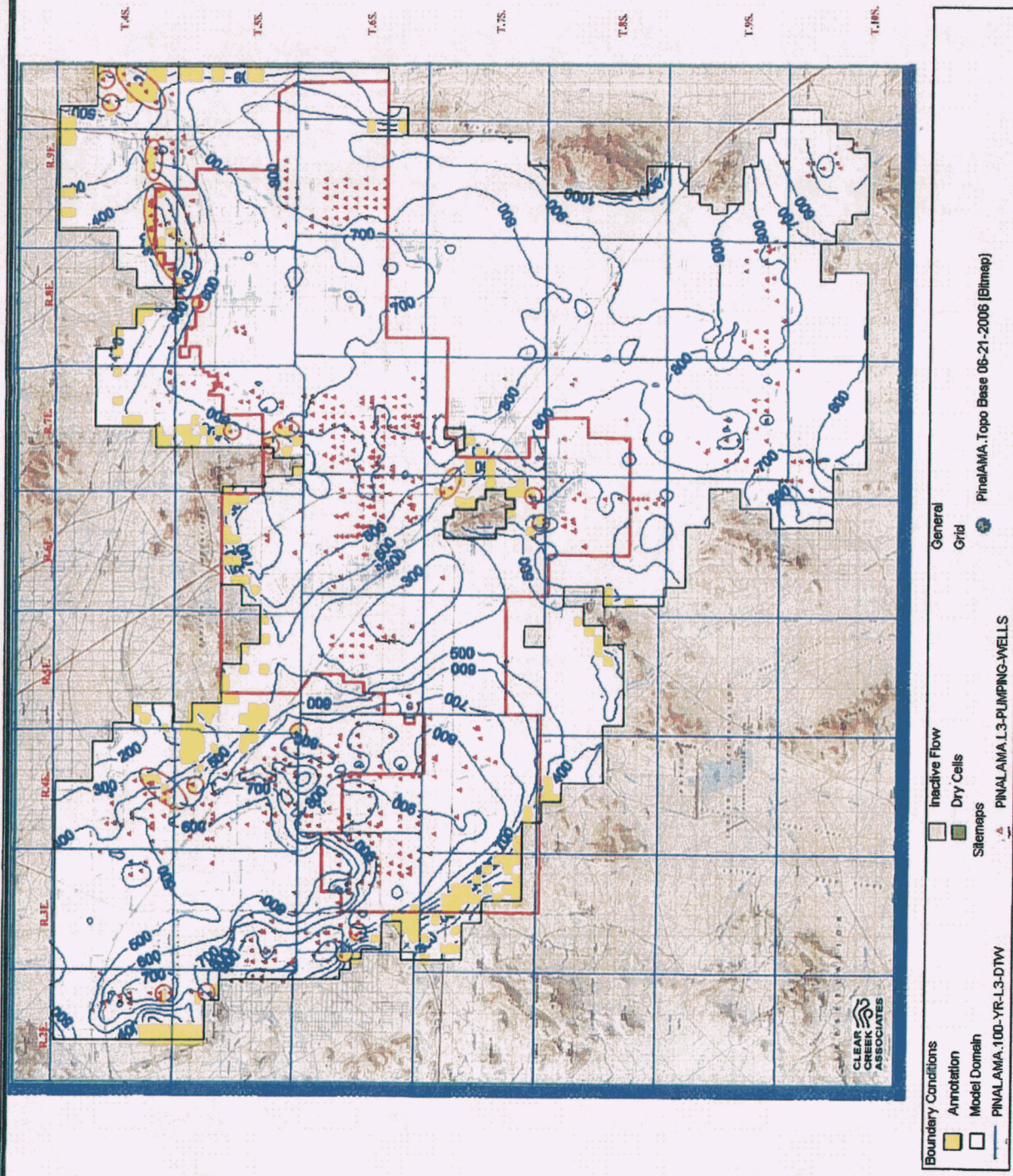
— Pinal Valley Water Service Area

**Boundary Conditions**  
 Annotation  
 Model Domain  
 PINALAMA, 100-YR-L2-DTW

Inactive Flow  
 Dry Cells  
 Sitemaps  
 PINALAMA.DT\_BEDRK

General  
 Grid  
 PinalAMA, Topo Base 06-21-2006 (Eltmap)

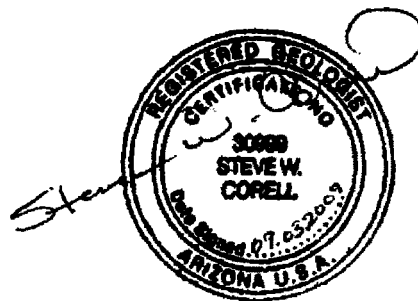
**FIGURE 6**  
**Depth-to-Bedrock & 100-Year Calculated DTW --**  
**Layer 2**  
 Arizona Water Company  
 Pinal Valley Water Service Area  
 Physical Availability Demonstration (September 2009)



**FIGURE 7**  
**100-Year Calculated DTW -- Layer 3**  
 Arizona Water Company  
 Pinal Valley Water Service Area  
 Physical Availability Demonstration (September 2009)



## TABLES



*Expires: 03-31-2012*

Table 1  
Maricopa-Stanfield Sub-basin -- Current and Committed Demand Pumping

REGISTRYID	LOCATION	INSTALLED	WELLDEPTH	OWNER	Sub-basin	CCLN Sub Area	2008 - 2107 (AF)
620624	D-05-04 14CCB	1-Jan-59	900	CITY OF CASA GRANDE	Maricopa-Stanfield	Copper Mountain Community (4113.86 aly)	1,371.2
620625	D-05-04 14CCC	1-Jan-59	1300	CITY OF CASA GRANDE	Maricopa-Stanfield	Copper Mountain Community (4113.86 aly)	1,371.2
620626	D-05-04 23BBB	1-Jan-60	900	CITY OF CASA GRANDE	Maricopa-Stanfield	Copper Mountain Community (4113.86 aly)	1,371.2
612737	D-04-03-14CCB		1000	SMITH, J E	Maricopa-Stanfield		4113.86
601069	D-04-03-15CCC	1-Jan-57	500	FRIEDMAN, BEN, C	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
617337	D-04-03-15DCD	22-Apr-55	700	VANCE JR, J D	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
612738	D-04-03-22BDC		1000	SMITH, J E	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
612742	D-04-03-22DDD		600	MARICOPA GRVS-SMITH,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
612739	D-04-03-23BDD		1200	SMITH, J E	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
624036	D-04-03-23DDC	28-Jun-60	1920	ORCHARD CITY INC,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
623818	D-04-03-25DDD	1-Sep-63	1700	SMITH, J E	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
605054	D-04-03-26CBD	1-Jan-71	1400	TURF GRASS FARMS INC,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
612741	D-04-03-27DAD		1875	MARICOPA GRVS-SMITH,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
622132	D-04-03-28ABC	10-Mar-76	600	JOHNSON JR, L L	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
622128	D-04-03-33ADD	1-Jan-62	500	JOHNSON JR, L L	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
612711	D-04-03-34CDD		600	DUNN FARMS,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
612712	D-04-03-35CCC	1-Jan-63	2458	DUNN FARMS,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
623817	D-04-03-36ADD	1-Sep-61	1400	SMITH, J E	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
610519	D-04-04-28DAA	1-Jan-54	830	ANDERSON, OLIVER,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
509941	D-04-04-29CCD	26-Aug-65	1100	MAGGIO, ANTHONY, J	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
623902	D-04-04-29CDD		995	MAGGIO, ANTHONY, J	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
508231	D-04-04-30DAA	1-Jan-58	830	FEMCO LIMITED PNTSHP,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
605234	D-04-04-31DDD	1-Jan-48	500	FEMCO LIMITED PNTSHP,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
609593	D-04-04-32CDD	1-Jan-58	954	SEL THE FARM LC,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
608592	D-04-04-32DAA	1-Jan-58	1000	SEL THE FARM, LC,	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.41
622119	D-05-04-08ADD	1-Jan-76	963	HARTMAN, P M	Maricopa-Stanfield	Santa Cruz Water Co N (14154.47 aly)	615.45
612414	D-05-03-17CCB	1-Jan-68	1000	MCLEAN FARMS ETAL,	Maricopa-Stanfield		14,184.47
612249	D-05-03-17CCC	1-Jan-68	1000	MCLEAN FARMS ETAL,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612247	D-05-03-17DCC	1-Jan-73	1000	MCLEAN FARMS ETAL,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
602618	D-05-03-18BCC	24-Jul-62	1360	DIAMOND BAR RANCH LC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
625625	D-05-03-18CCC	1-Jan-69	1005	DIAMOND BAR RANCH LC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
625626	D-05-03-18CDD	1-Jan-60	1300	DIAMOND BAR RANCH LC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612407	D-05-03-19DBB	1-Jan-74	1000	M GROUP ONE JV,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612406	D-05-03-19DCC	1-Jan-61	605	M GROUP ONE JV,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612248	D-05-03-20DBB	1-Jan-71	1000	MCLEAN FARMS ETAL,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612246	D-05-03-20DCC	1-Jan-62	1300	MCLEAN FARMS ETAL,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612250	D-05-03-26BCB	1-Jan-76	1200	MARICOPA RD ASSOC.,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612401	D-05-03-28CBB	1-Jan-59	1200	MARICOPA RD ASSOC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612402	D-05-03-28CCC	1-Jan-59	900	ELMORE, JACKSON,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
612403	D-05-03-28CDD	1-Jan-57	900	ELMORE, JACKSON,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
625623	D-05-03-29BCC	1-Jan-64	1000	HAM LIMITED LLC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
625627	D-05-03-29CBC	1-Jan-78	1400	HAM LIMITED LLC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
625622	D-05-03-29CCC	1-Jan-61	1000	HAM LIMITED LLC,	Maricopa-Stanfield	Santa Cruz Water Co SW (17,753.95 aly)	1,044.35
999136	D-05-03-26AAA			SANTA ROSA WATER CO NEW WELL 1	Maricopa-Stanfield		17,753.95
999137	D-05-03-26DDD			SANTA ROSA WATER CO NEW WELL 2	Maricopa-Stanfield	Santa Rosa Water Co (9,478.09 aly)	1,895.22
999138	D-05-03-27ACC			SANTA ROSA WATER CO NEW WELL 3	Maricopa-Stanfield	Santa Rosa Water Co (9,478.09 aly)	1,895.22
999139	D-05-03-24CCC			SANTA ROSA WATER CO NEW WELL 4	Maricopa-Stanfield	Santa Rosa Water Co (9,478.09 aly)	1,895.22
999140	D-05-03-24DDD			SANTA ROSA WATER CO NEW WELL 5	Maricopa-Stanfield	Santa Rosa Water Co (9,478.09 aly)	1,895.22
999141	D-05-03-03ACC			WESTERN PUEBLO RANCHETTES NEW WELL 1	Maricopa-Stanfield	The Ranches at Maricopa (42 aly)	42.00
634208	D-05-02-24DBB	7-Feb-81	750	THUNDERBIRD FARMS (58-001342.0000)	Maricopa-Stanfield		42.00
634209	D-05-02-24BAA	10-Mar-80	600	THUNDERBIRD FARMS (58-001342.0000)	Maricopa-Stanfield	Thunderbird Farms ID (1092 aly)	546
					Maricopa-Stanfield	Thunderbird Farms ID (1092 aly)	546
					Maricopa-Stanfield		1,092.00
							48,832.17

Table 2  
Eloy Sub-basin -- Current and Committed Demand Pumping

REGISTRYID	LOCATION	INSTALLED	WELDEPTH	OWNER	Sub-basin	CCAN Sub Area	2008 - 2030 (AF)	2031 - 2107 (AF)
211832	D-04-08 18BAA	5/28/2006	770	JOHNSON UTILITIES	Eloy	Johnson Final DAWs (56-001538.0000)	531.82	531.82
212512	D-04-08 20CCC	10/18/2006	835	JOHNSON UTILITIES	Eloy	Johnson Final DAWs (56-001538.0000)	531.82	531.82
212514	D-04-08 30BBO	10/6/2006	800	JOHNSON UTILITIES	Eloy	Johnson Final DAWs (56-001538.0000)	531.82	531.82
						Sub-Total	1595.46	1595.46
604910	D-07-08 35ACC	1/1/1973	825	ISOM, W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604506	D-07-08 35ACD	1/1/1982	790	ISOM, W W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604508	D-07-08 35ADD	1/1/1978	1001	ISOM, W W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
605487	D-07-07 10DDD		1000	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
605461	D-07-07 30DCC	7/8/1973	1000	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
605459	D-07-07 36DCC	4/1/1981	1006	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604285	D-07-08 30CDD	1/1/1948	608	T.L.C. INVESTMENTS	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604284	D-07-08 30CDD	1/1/1930	565	T.C.L. INVEST CORP.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
601358	D-07-08 310DA		1200	ALEMAN, KATHY K.W.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
601354	D-07-08 310DD		1000	ALEMAN, KATHY K.W.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
601358	D-07-08 320CD		750	ALEMAN, KATHY K.W.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
601357	D-07-08 320CD		790	ALEMAN, KATHY K.W.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
621871	D-07-08 33BDO	1/1/1951	1400	ROHE, ADELE W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
621873	D-07-08 33CDD		1400	ROHE, ADELE W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
621874	D-07-08 33DDB		1400	ROHE, ADELE W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
621872	D-07-08 33DCC		1400	ROHE, ADELE W	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604063	D-08-07 210DD	1/1/1948	1887	HAMILTON FARMS	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604061	D-08-07 22ADD	1/1/1938	800	HAMILTON FARMS	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604074	D-08-07 26ADD	1/1/1978	1720	HAMILTON FARMS	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
617838	D-08-07 28DDD		1200	ADVISO MORTGAGE INC.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
604068	D-08-07 28DDD	1/1/1947	1000	HAMILTON FARMS	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
617922	D-08-07 35BDD	1/1/1959	1600	ADVISO MORTGAGE INC.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
617937	D-08-07 35DDA	1/1/1957	1100	ADVISO MORTGAGE INC.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
617936	D-08-07 35DCC	1/1/1976	1200	ADVISO MORTGAGE INC.	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
691447	D-08-08 08CCA	1/15/2002	1100	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
605432	D-08-08 08CCA	1/27/1981	1115	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
605454	D-08-08 08DCB	11/20/1980	1100	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
605434	D-08-08 08DBB		1000	ELOY, CITY OF	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
626501	D-08-08 18ADD		1500	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
626502	D-08-08 18CDD	11/28/1973	1500	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
618526	D-08-08 20DDD		2100	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
626498	D-08-08 21BAA	3/18/1974	1500	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
626497	D-08-08 21BDD		1500	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
618530	D-08-08 21CDD	2/1/1980	1810	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
618528	D-08-08 28BCC		1885	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
626496	D-08-08 28BDD	2/24/1954	1345	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
618534	D-08-08 28CCC		888	RANCHO TERRA PRIETA	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
654684	D-08-08 28CCC	1/1/1937	1500	GRUNT	Eloy	ELOY DESIGNATION (48,545 a/y)	960	1,277.50
						Sub-Total	34,490	43,846
610432	D-04-09 25BDD	1/1/1940	350	FLORENCE TOWN OF	Eloy	FLORENCE DESIGNATION (12,310.7 a/y)	2,462.14	2,462.14
618533	D-04-09 38CAC	1/1/1947	375	FLORENCE TOWN OF	Eloy	FLORENCE DESIGNATION (12,310.7 a/y)	2,462.14	2,462.14
610433	D-04-09 25BDD	1/1/1940	350	FLORENCE TOWN OF	Eloy	FLORENCE DESIGNATION (12,310.7 a/y)	2,462.14	2,462.14
618538	D-04-09 38CAC	7/5/1939	875	FLORENCE TOWN OF	Eloy	FLORENCE DESIGNATION (12,310.7 a/y)	2,462.14	2,462.14
618534	D-05-09 02ADA	1/1/1953	575	FLORENCE TOWN OF	Eloy	FLORENCE DESIGNATION (12,310.7 a/y)	2,462.14	2,462.14
						Sub-Total	12,310.7	12,310.7
612758	D-08-09 04CCC	12/28/1980	1800	DESERT SUN FARMS LLC	Eloy	PALMILLA (2,810.77 a/y)	702.7	702.7
612758	D-08-09 04CDA		1800	DESERT SUN FARMS LLC	Eloy	PALMILLA (2,810.77 a/y)	702.7	702.7
612780	D-08-09 04ADD	8/12/1980	1500	DESERT SUN FARMS LLC	Eloy	PALMILLA (2,810.77 a/y)	702.7	702.7
612756	D-08-09 04DDD		1500	DESERT SUN FARMS LLC	Eloy	PALMILLA (2,810.77 a/y)	702.7	702.7
						Sub-Total	2810.8	2810.8
999398	D-08-07 33CCC			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
999397	D-08-07 33DCC			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
999398	D-08-07 33DDO			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
999395	D-08-07 34BDB			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
999400	D-07-07 03BCC			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
999401	D-07-07 03CCC			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
999399	D-07-07 04ACC			PICACHO WATER COMPANY	Eloy	Picacho Water Co (11,854.71 a/y)	1,893.5	1,893.5
						Sub-Total	11,854.71	11,854.71
621804	D-05-07 24AAA	1/1/1975	1600	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621805	D-05-07 24ABB	1/1/1972	1230	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621823	D-05-07 24ACD	1/1/1938	360	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621806	D-05-07 24BCD	1/1/1946	1525	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621824	D-05-07 24BDC	1/1/1947	497	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621810	D-05-07 25AAC	1/1/1955	560	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621822	D-05-07 25ACC	1/1/1958	450	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
621818	D-05-07 25CAD	1/1/1963	580	SUNDANCE FARMS INC.	Eloy	Sand (8895.06 a/y)	1,211.88	1,211.88
						Sub-Total	9,895.06	9,895.06
606219	D-08-08 14DDD	6/28/1948	1653	SUNLAND WATER COMPANY	Eloy	SUNLAND WATER CO (640.37 a/y)	640.37	640.37
						Sub-Total	640.37	640.37
601126	D-07-08 27CCD			VILLA GRANDE DWD	Eloy	VILLA GRANDE DWD (100.81 a/y)	50.41	50.41
601140	D-07-08 28DDD	1/1/1960	1624	VILLA GRANDE DWD	Eloy	VILLA GRANDE DWD (100.81 a/y)	50.41	50.41
						Sub-Total	100.81	100.81
622043	D-08-08 22ABD			PICACHO WID (56-001331.0000)	Eloy	Picacho WID (568 a/y)	284.00	284.00
622044	D-08-08 22ADD			PICACHO WID (56-001331.0000)	Eloy	Picacho WID (568 a/y)	284.00	284.00
						Sub-Total	568.00	568.00
TOTAL							74,054.91	88,126.81

Table 3

ALL VOLUMES IN ACRE-FT. - Values in parenthesis ( ) are negative

Table 4  
Agricultural Recharge Estimate for 100-Year Simulation  
(Arizona Water Company Final Model)

Year	Total At-Chin GW Pumping	At-Chin Return Flow <sup>1</sup>	Total SCIDD GW Pumping	SCIDD Return Flow <sup>2</sup>	MSIDD	MSIDD AG converted to Muni	MSIDD GW Pumping	MSIDD LTSCs	CAIDD AG converted to Muni	CAIDD LTSCs	CAIDD Net GW Pumping	CAIDD Return Flow <sup>3</sup>	HD LTSCs	HD Net GW Pumping	HD Return Flow <sup>4</sup>	Non-District Return Flow <sup>5</sup>	GRIC Return Flow <sup>6</sup>	TOTAL
2008 ROGR except SCIDD (2005)	250	28,297	30,028	151,851	134,330	(4,011)	13,569	143,889	128,848	(9,789)	8,137	125,215	43,825	90,528	31,894	29,883	12,308	328,009
2009 to 2015	250	28,297	33,935	151,851	108,775	(13,150)	13,569	116,188	81,987	(7,898)	8,137	82,426	28,848	90,528	31,894	29,883	12,308	301,229
2016 to 2020	250	28,297	33,935	151,851	108,775	(13,150)	13,569	116,188	81,987	(7,898)	8,137	82,426	28,848	90,528	31,894	29,883	12,308	301,229
2021 to 2025	250	28,297	33,935	151,851	108,775	(13,150)	13,569	116,188	81,987	(7,898)	8,137	82,426	28,848	90,528	31,894	29,883	12,308	301,229
2026 to 2030	250	28,297	33,935	151,851	108,775	(13,150)	13,569	116,188	81,987	(7,898)	8,137	82,426	28,848	90,528	31,894	29,883	12,308	301,229
2031 to 2035	250	28,297	37,477	151,851	150,000	0	13,569	163,569	150,000	0	8,137	158,137	55,348	90,528	31,894	29,883	12,308	348,420
2036 to 2057	250	28,297	37,477	151,851	150,000	0	13,569	163,569	150,000	0	8,137	158,137	55,348	90,528	31,894	29,883	12,308	348,420
2058 to 2108	0	28,297	37,477	151,851	150,000	0	0	150,000	150,000	0	0	158,137	52,560	80,000	28,000	29,883	12,308	335,138

Notes:

ALL VOLUMES IN ACRE-FT - Values in parenthesis ( ) are negative

At-Chin Return Flow <sup>1</sup>	Average CAP delivery 1988 to 2005 Return flow, assume 35% I.E. and 5% system loss	76,742 a/y 28,297
SCIDD Return Flow <sup>2</sup>	1984 to 2000 average agricultural recharge 1984 to 2000 average main canal losses 1984 to 2000 average lateral losses 1985 to 2000 average return flow (to account for surface water delivery, main canal losses, and lateral canal losses)	90,344 a/y 23,434 a/y 56,073 a/y 131,851 a/y
MSIDD Return Flow <sup>3</sup>	Based on assumed pumping and a return flow of 35% I.E.	
CAIDD Return Flow <sup>4</sup>	Based on assumed pumping and a return flow of 35% I.E.	
HD Return Flow <sup>5</sup>	Based on assumed pumping and a return flow of 35% I.E.	
Non-District Return Flow <sup>6</sup>	1984 to 2001 average	29,883 a/y
GRIC Return Flow <sup>7</sup>	1984 to 2004 average	12,308 a/y

**TABLE 5**  
**100-YEAR PUMPING ANALYSIS - - CONCEPTUAL VS. MODELED**  
**ARIZONA WATER COMPANY PINAL MODEL**

SP	Model Days	Year	Cumulative Pumping Model (ft³)	Total Model Pumping (AF)	Model Pumping less Boundary Wells Out (AF)	Santan-Bacelon Gap (ft³/d)	Florencia Gap (ft³/d)	Boundary Wells Out (AF)	Conceptual Pumping Non-AWC (AF)	Conceptual Pumping AWC (AF)	Total Conceptual Pumping (AF)	Model Deficit (AF)				
1	365	2008	25,488,871,424	588,144	575,888	720,600	384,280	9,258	557,909	17,153	575,062	824				
2	730	2009	51,177,181,184	589,722	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
3	1095	2010	76,865,486,040	589,723	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
4	1460	2011	102,553,804,800	589,722	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
5	1825	2012	129,242,114,560	589,722	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
6	2190	2013	155,930,432,512	589,723	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
7	2555	2014	179,618,742,272	589,722	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
8	2920	2015	205,307,052,032	589,722	580,465	720,600	384,280	9,258	555,085	25,000	580,085	380				
9	3285	2016	231,853,113,344	609,414	600,156	720,600	384,280	9,258	555,085	45,000	600,085	71				
10	3650	2017	258,386,837,504	609,130	599,873	720,600	384,280	9,258	555,085	45,000	600,085	-212				
11	4015	2018	284,920,741,888	609,135	599,877	720,600	384,280	9,258	555,085	45,000	600,085	-208				
12	4380	2019	311,454,957,568	609,142	599,884	720,600	384,280	9,258	555,085	45,000	600,085	-201				
13	4745	2020	337,984,464,856	609,033	599,779	720,600	384,280	9,258	555,085	45,000	600,085	-309				
14	5110	2021	364,533,513,216	618,665	609,407	720,600	384,280	9,258	555,085	65,000	610,085	-678				
15	5475	2022	391,882,571,776	618,665	609,407	720,600	384,280	9,258	555,085	65,000	610,085	-678				
16	5840	2023	418,831,830,336	618,665	609,407	720,600	384,280	9,258	555,085	65,000	610,085	-678				
17	6205	2024	445,789,878,848	618,413	609,155	720,600	384,280	9,258	555,085	65,000	610,085	-934				
18	6570	2025	472,704,974,848	618,349	609,091	720,600	384,280	9,258	555,085	65,000	610,085	-994				
19	6935	2026	500,534,837,248	638,888	629,628	720,600	384,280	9,258	555,085	75,500	630,585	-957				
20	7300	2027	528,364,899,648	638,888	629,628	720,600	384,280	9,258	555,085	75,500	630,585	-957				
21	7665	2028	556,194,594,816	638,888	629,629	720,600	384,280	9,258	555,085	75,500	630,585	-957				
22	8030	2029	584,024,457,216	638,888	629,628	720,600	384,280	9,258	555,085	75,500	630,585	-957				
23	8395	2030	611,854,319,616	638,888	629,628	720,600	384,280	9,258	555,085	75,500	630,585	-957				
24	8760	2031	648,532,066,304	842,005	832,747	720,600	384,280	9,258	724,978	110,000	834,978	-2,231				
25	9125	2032	685,087,391,744	839,195	829,937	720,600	384,280	9,258	724,978	110,000	834,978	-5,041				
26	9490	2033	721,642,717,184	839,195	829,937	720,600	384,280	9,258	724,978	110,000	834,978	-5,041				
27	9855	2034	758,198,042,624	839,195	829,937	720,600	384,280	9,258	724,978	110,000	834,978	-5,041				
28	10220	2035	794,753,368,064	839,195	829,937	720,600	384,280	9,258	724,978	110,000	834,978	-5,041				
29	10585	2036	831,308,693,504	849,350	840,092	720,600	384,280	9,258	724,978	120,000	844,978	-4,886				
30	10950	2037	868,748,754,944	849,350	840,092	720,600	384,280	9,258	724,978	120,000	844,978	-4,886				
31	11315	2038	905,748,448,384	849,350	840,092	720,600	384,280	9,258	724,978	120,000	844,978	-4,886				
32	11680	2039	942,744,141,824	849,350	840,092	720,600	384,280	9,258	724,978	120,000	844,978	-4,886				
33	12045	2040	979,741,835,264	849,350	840,092	720,600	384,280	9,258	724,978	120,000	844,978	-4,886				
34	12410	2041	1,016,700,000,000	848,443	839,185	720,600	384,280	9,258	724,978	120,000	844,978	-5,793				
35	12775	2042	1,053,700,000,000	849,403	840,145	720,600	384,280	9,258	724,978	120,000	844,978	-4,833				
36	13140	2043	1,090,600,000,000	847,107	837,850	720,600	384,280	9,258	724,978	120,000	844,978	-7,128				
37	13505	2044	1,127,600,000,000	849,403	840,145	720,600	384,280	9,258	724,978	120,000	844,978	-4,833				
38	13870	2045	1,164,500,000,000	847,107	837,850	720,600	384,280	9,258	724,978	120,000	844,978	-7,128				
39	14235	2046	1,201,400,000,000	847,107	837,850	720,600	384,280	9,258	724,978	120,000	844,978	-7,128				
40	14600	2047	1,238,400,000,000	849,403	840,145	720,600	384,280	9,258	724,978	120,000	844,978	-4,833				
41	14965	2048	1,275,400,000,000	847,587	838,309	720,600	384,280	9,258	724,978	120,000	844,978	-6,669				
42	15330	2049	1,312,400,000,000	845,271	836,057	720,600	384,280	9,258	724,978	120,000	844,978	-8,321				
43	15695	2050	1,349,400,000,000	842,213	803,599	720,600	384,280	9,258	692,494	120,000	812,494	-10,731				
44	16060	2051	1,386,400,000,000	810,375	801,763	720,600	384,280	9,258	692,494	120,000	812,494	-17,129				
45	16425	2052	1,423,400,000,000	808,640	800,570	720,600	384,280	9,258	692,494	120,000	812,494	-18,228				
46	16790	2053	1,460,400,000,000	803,030	796,288	720,600	384,280	9,258	692,494	120,000	812,494	-20,054				
47	17155	2054	1,497,400,000,000	800,275	795,265	720,600	384,280	9,258	692,494	120,000	812,494	-21,708				
48	17520	2055	1,534,400,000,000	798,143	792,440	720,600	384,280	9,258	692,494	120,000	812,494	-24,630				
49	17885	2056	1,571,400,000,000	793,848	788,240	720,600	384,280	9,258	692,494	120,000	812,494	-26,762				
50	18250	2057	1,608,400,000,000	789,715	784,884	720,600	384,280	9,258	692,494	120,000	812,494	-28,109				
51	18615	2058	1,645,400,000,000	785,583	780,732	720,600	384,280	9,258	692,494	120,000	812,494	-29,619				
52	18980	2059	1,682,400,000,000	778,237	776,365	720,600	384,280	9,258	692,494	120,000	812,494	-30,109				
			total model pumping =	76,783,747				total boundary wells out =	705,615				-1,150,407			
			net model pumping =	76,078,131												
			conceptual pumping cumulative =	77,228,638												
			total model deficit =	-1,150,407												
			percent pumping simulated =	98.51%												

AF = Acre-Feet  
 AWC = Arizona Water Company  
 ft³/d = cubic feet per day  
 Non-AWC = Non-Arizona Water Company  
 SP = Stress Period

TABLE 6  
Wells Used to Simulate Arizona Water Company Demand

WellName	LOCATION	INSTALLED	WELLDEPTH	CASINGDEEP	Scenario_Well_Name	Sqm_Top	Sqm_Bot	Rbts	Screen_Top	Screen_Bottom	Year/Model Days									
											2008	2015	2020	2025	2030	2035	2040	2045	2107	
208822	D-06-06-22DDD	Apr-06	1000	1000	AWC CG30	580	980	730.0	435.0	435.0	385	2020	4745	6570	8395	10220	12045	12045	36500	
210293	D-05-08-20ACD	Nov-06	1985	1985	AWC CL11	646	1857	759.8	-135.0	-135.0	420	674	709.4	469.8	374.1	457.4	499	499	499	
210294	D-06-06-15CAD	May-06	1500	1500	AWC CG31	580	1480	825.0	-70.0	-70.0	40.2	1010.9	1084	704.7	581.1	686.1	748.4	748.4	748.4	
212419	D-05-08-208BA		1250	1250	AWC CL13	560	1240	865.0	150.0	150.0	0.6	1010.9	1084	704.7	581.1	686.1	748.4	748.4	748.4	
212523	D-06-06-25ACA		1200	1200	AWC CG33	520	980	807.8	447.8	447.8	976.7	943.5	709.4	469.8	374.1	457.4	499	499	499	
508809	D-06-06-22CDD	12-Oct-83	1238	1238	AWC CG21	390	990	1020.0	177.0	177.0	1296.5	673.9	709.4	469.8	374.1	457.4	499	499	499	
522318	D-06-06-22BAA	1-Feb-83	1005	1005	AWC CG23	390	990	1020.0	425.0	425.0	1296.5	673.9	709.4	469.8	374.1	457.4	499	499	499	
528586	D-06-04-19CDA		1002	1002	AWC ST03	394	1002	891.0	288.0	288.0	73.2	404.3	425.6	281.9	224.4	274.4	299.4	299.4	299.4	
540306	D-06-06-22CDD	23-Dec-93	1000	1000	AWC CG24	380	990	1020.0	425.0	425.0	517.4	673.9	709.4	469.8	374.1	457.4	499	499	499	
546719	D-06-06-228DA	17-Feb-96	1074	1074	AWC CG25	416	1057	984.0	358.0	358.0	2017.3	873.9	709.4	469.8	374.1	457.4	499	499	499	
560803	D-06-06-15CDD	18-Feb-97	1240	1240	AWC CG26	500	1240	805.0	170.0	170.0	1419.7	1010.9	1084	704.7	581.1	686.1	748.4	748.4	748.4	
568553	D-06-07-088AA	1-Nov-88	1110	1110	AWC CG27	550	1080	1000.0	870.0	870.0	441.7	873.9	0	0	0	0	0	0	0	
571206	D-07-06-350DD		1387	1387	AWC CG28	620	1040	860.0	675.0	675.0	1086.3	1010.9	1084	704.7	581.1	686.1	748.4	748.4	748.4	
586284	D-06-06-258CB	Apr-99	1100	1100	AWC CG28	540	1080	890.0	355.0	355.0	788.9	1010.9	1084	704.7	581.1	686.1	748.4	748.4	748.4	
616598	D-06-06-010DB	Jan-70	1100	1100	AWC CG34	450	1100	1050.0	405.0	405.0	0	337	355	235	187	228	250	250	250	
616594	D-06-06-098BD	1-Jan-88	1058	1058	AWC CG09			1058.0	340.0	340.0	0	0	0	0	0	0	0	0	0	
616595	D-06-06-218BC	1-Jan-80	1260	1260	AWC CG10			1085.0	230.0	230.0	588.2	673.9	709.4	469.8	374.1	457.4	499	499	499	
616598	D-06-06-218BB		800	800	AWC CG14			1000.0	230.0	230.0	178.6	673.9	709.4	469.8	374.1	457.4	499	499	499	
616599	D-06-06-16CDD	1-Jan-78	810	810	AWC CG ABAND			1075.0	800.0	800.0	0	0	0	0	0	0	0	0	0	
616600	D-06-06-228BD	1982	808	808	AWC CG25 OLD	94	785	1318.0	620.0	620.0	870.9	673.9	709.4	469.8	374.1	457.4	499	499	499	
616601	D-06-06-15CDB	28-Apr-75	805	735	AWC CG17			1075.0	605.0	605.0	0.5	471.7	490.5	328.9	261.8	300.2	348.3	348.3	348.3	
616603	D-06-06-23CBB	8-Aug-80	1000	1000	AWC CG19	358	974	1057.0	446.0	446.0	1580.5	1347.5	1415.7	938.6	748.1	914.8	987.9	987.9	987.9	
616604	D-06-06-228AD	2-Nov-77	1000	1000	AWC CG20			1075.0	415.0	415.0	1671.4	673.9	709.4	469.8	374.1	457.4	499	499	499	
616605	D-06-06-22CAA	4-Apr-86	1105	1105	AWC CL07			1080.0	325.0	325.0	73.6	168.5	482.7	319.7	254.5	311.2	335.5	335.5	335.5	
616606	D-06-06-108CA	10-May-81	475	475	AWC CL09			928.0	760.0	760.0	1482.1	873.9	0	0	0	0	0	0	0	
616608	D-06-06-108BA	1-May-78	1000	980	AWC CL10			928.0	762.0	762.0	613.2	673.9	709.4	469.8	374.1	457.4	499	499	499	
616682	D-06-07-35ADG				AWC TG01			1000.0	470.0	470.0	176.7	259.6	709.4	469.8	374.1	457.4	499	499	499	
616683	D-06-07-35ADD		608	508	AWC TG03			1000.0	470.0	470.0	0	652	709.4	469.8	374.1	457.4	499	499	499	
616684	D-06-04-20CCC		811	811	AWC ST01			910.0	489.0	489.0	19.2	87.5	709.4	469.8	374.1	457.4	499	499	499	
616686	D-06-06-17CDD	1930	345	345	AWC VF01			1200.0	770.0	770.0	0	101.1	381.6	252.8	201.2	246.1	268.4	268.4	268.4	
616687	D-06-06-17CDD	Mar-71	700	700	AWC VF02			1200.0	770.0	770.0	83.5	0	0	0	0	204	223	223	223	
622167	D-06-06-22DDO		1200	1200	AWC CG22 ABAND	680	980	730.0	435.0	435.0	0	0	0	0	0	0	0	0	0	
801030	D-06-07-38ADD				AWC TG			1000.0	470.0	470.0	0.01	0	40	26	24	92	101	101	101	
999142	D-05-09-31ACC				AWC-New-1	500	1500	992.0	-8.0	-8.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999143	D-05-09-31ACC				AWC-New-2	500	1500	979.0	-21.0	-21.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999144	D-05-09-32BCC				AWC-New-3	500	1500	1004.0	4.0	4.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999145	D-05-09-33AAA				AWC-New-4	500	1500	481.0	37.0	37.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999146	D-05-09-33AAA				AWC-New-5	500	1500	518.0	44.0	44.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999147	D-05-09-33ADD				AWC-New-6	500	1500	518.0	44.0	44.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999148	D-05-09-33BCC				AWC-New-7	500	1500	410.0	30.0	30.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999149	D-05-09-34ABB				AWC-New-8	500	1500	549.0	53.0	53.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999150	D-05-09-34ACC				AWC-New-9	500	1500	611.0	81.0	81.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999151	D-05-09-34ADD				AWC-New-10	500	1500	718.0	83.0	83.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999152	D-05-09-35BCC				AWC-New-11	500	1500	722.0	83.0	83.0	0	673.9	709.4	469.8	374.1	457.4	499	499	499	
999153	D-06-07-05CCC				AWC-New-12	1014	1525	505.1	-5.4	-5.4	0	0	0	0	469.8	374.1	503.1	548.8	548.8	
999154	D-06-07-05DDD				AWC-New-13	1221	1697	301.8	-174.4	-174.4	0	0	0	0	469.8	374.1	503.1	548.8	548.8	
999155	D-06-07-04DDD				AWC-New-14	1000	1500	530.8	30.6	30.6	0	0	0	0	469.8	374.1	503.1	548.8	548.8	
999156	D-06-07-08BCC				AWC-New-15	526	1028	988.6	486.6	486.6	0	0	0	0	469.8	374.1	503.1	548.8	548.8	

Table 06 Macro for AWC wells.xls

TABLE 6

[illegible]

Table 06 Macro for AWC wells.xls



TABLE 8

[illegible]

TABLE 6

177,153	25,001	45,002	55,000	75,500	110,000	120,000	120,000
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**Table 7**  
**Zone Budget Analysis of Current Committed Demand**

MODFLOW ZoneBudget No.	Zone Description	Demand (AFY)	Model Pumping SP-52 (ft <sup>3</sup> /d)	Model Pumping SP-52 (AF)	Model Deficit (AF)	% Model Simulated
	<b>Maricopa-Stanfield Sub-basin</b>					
25	Santa Cruz Water Company	37,390.43	4,511,800	37,805	415	101%
34	Copper Mountain Comm. Designation	4,613.66	550,960	4,617	3	100%
35	Santa Rosa Water Co. Designation	9,476.09	1,130,800	9,475	-1	100%
36	Ranches at Maricopa Designation	42.00	5,004	42	0	100%
37	Thunderbird Farms Improvement District	1,125.44	134,340	1,126	0	100%
38	Maricopa DWID	26.40	3,156	26	0	100%
	<b>MST Sub-basin Totals</b>	<b>52,674.02</b>		<b>53,091</b>	<b>417</b>	<b>101%</b>
	<b>Eloy Sub-basin</b>					
26	Eloy Designation	48,545.00	5,792,400	48,536	-9	100%
27	Johnson Pinal DAWs	1,597.00	190,540	1,597	0	100%
28	Florence Designation	12,310.00	1,468,500	12,305	-5	100%
29	Palmilla Designation	2,810.77	335,660	2,813	2	100%
30	Picacho Water Co. Designation	12,256.74	1,463,100	12,260	3	100%
31	Woodruff Water Company	9,695.06	1,156,300	9,689	-6	100%
32	Sunland Water Co. Designation	649.89	77,564	650	0	100%
33	Villa Grande DWID Designation	100.81	11,933	100	-1	99%
39	Picacho Water Improvement District	780.10	93,154	781	0	100%
	<b>Eloy Sub-basin Totals</b>	<b>88,745.37</b>		<b>88,729</b>	<b>-16</b>	<b>100.0%</b>
	<b>TOTAL</b>	<b>141,419.39</b>		<b>141,820.53</b>	<b>401.14</b>	<b>100.3%</b>

24	Arizona Water Company	120,000	14,324,000	120,024.33	24.33	100.0%
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AFY            acre-feet/year  
AF             acre-feet  
SP             Stress period (SP 52 is the last stress period and represents 100-years)

# Economic SYNOPSES

short essays and reports on the economic issues of the day

2009 ■ Number 4



## The Current Recession: How Bad Is It?

Charles S. Gascon, *Senior Research Associate*

On November 28, 2008, the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER) declared that a recession began in the United States in December 2007.<sup>1</sup> This committee defines a recession as “a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in production, employment, real income, and other indicators.” The U.S. economy has experienced six recessions over the past 40 years. On average these recessions have lasted 10.7 months. The longest recessions—beginning in November 1973 and July 1981—each lasted 16 months. The shortest recession—beginning in January 1980—lasted only six months. Although the end of the current recession is unclear, many economists expect it to extend into mid-2009, a duration of around 18 months.

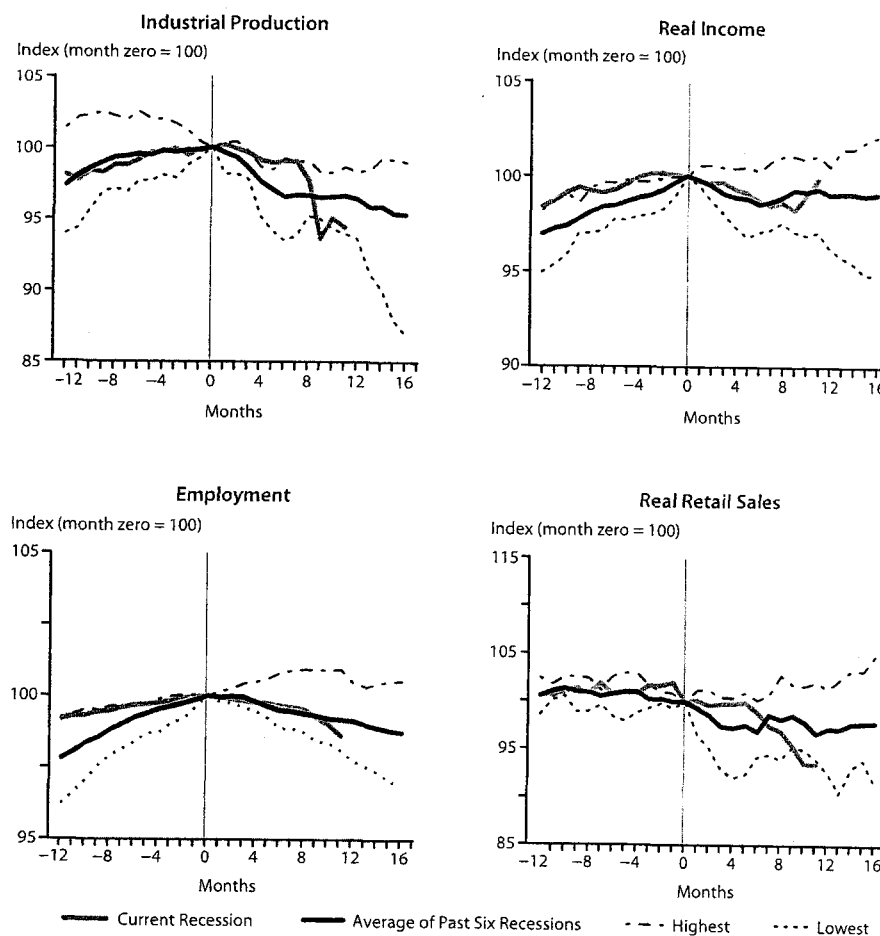
The most skeptical economists believe that because of the contraction in the housing market and problems in financial markets, the magnitude of the current recession could be the most severe in decades, perhaps comparable to the Great Depression. Although the causes of the current recession may be unique, main recession indicators have moved in a predictable fashion.

In a recession, the severity of the decline is just as relevant as the duration of the recession. These two measures are not independent; a prolonged but shallow recession may have an aggregate impact similar to a short but deep recession.

To compare the current recession with the past six recessions, the chart plots four main economic indicators

“In a recession, the severity of the decline is just as relevant as the duration of the recession.”

Comparison of Main Business Cycle Indicators



used by the NBER: industrial production, real personal income less transfer payments, employment, and real retail sales and food services.<sup>2</sup> Each series is indexed to 100 at the start of the recession. The horizontal axis indicates the number of months before (negative values) and after (positive values) the start of a recession, where zero indicates the month the NBER determined the economy moved into a recession.<sup>3</sup> The black line indicates the averages over the past six recessions,<sup>4</sup> the blue line data on the most recent recession, and the two dashed lines the highest and lowest values of each series, capturing variability across the past recessions.

Based on these indicators, the current recession has been worse than average; however, the declines are not unprecedented. In the previous recessions, industrial production tended to decline sharply at the business cycle peak; in the current recession, it did not decline sharply until early 2008. In the current recession, real income declines have been significant; at the start of the recession, incomes were above their pre-recession averages but are now slightly below average. Current employment trends are consistent with past recessions, although in recent months employment has

begun to approach its lowest levels. The most disturbing current indicator is the decline in real retail sales. Historically, retail sales have stabilized within months of the beginning of a recession; eleven months into this recession retail sales continue to decline.

Main recession indicators tend to support the claim that this recession could be the most severe in the past 40 years. However, we are still far from another Great Depression. The severities of the declines experienced so far have been consistent with past recessions, and although the length of the current recession could set a record, it will likely be only by a few months. ■

<sup>1</sup> The NBER is a not-for-profit corporation that sponsors economic research and promotes dialog on economic issues. By informal consensus, economists and policymakers accept the Business Cycle Dating Committee's judgment on business cycle turning points. The NBER report is available at [www.dev.nber.org/cycles/dec2008.html](http://www.dev.nber.org/cycles/dec2008.html).

<sup>2</sup> Deflated using the Consumer Price Index for All Urban Consumers (1982-84 = 100).

<sup>3</sup> According to the NBER, recessions began in December 1969 (lasting 11 months), November 1973 (16), January 1980 (6), July 1981 (16), July 1990 (8), and March 2001 (8).

<sup>4</sup> Because some recessions were shorter than 16 months, the average is pulled upward toward the end of the sample.

# 8 REASONS WHY (WE BELIEVE) THE RECESSION IS OVER

We believe the worst recession since the 1930s is over. Signs of recovery are everywhere. It's time for investors to look forward and to stop looking back. In this report, we discuss eight reasons why we believe this recession may be over.

## 1 Leading economic indicators are positive.

The Conference Board's Index of Leading Economic Indicators, which is designed to anticipate changes in the economy by three to six months, rose 0.6% in July for its fourth consecutive gain. This gauge has an impressive track record of calling turns in the economy. The stock market, another leading economic indicator, has already rebounded 50% from its March lows.

## 2 Global economies are recovering.

The Organisation for Economic Co-operation and Development's (OECD)<sup>1</sup> composite leading indicators for its member countries recorded their largest increase in June since records began in 1962. For the first time ever, all 33 countries recorded an increase. Japan's economy grew this past quarter for the first time since early last year. Europe also appears to be pulling out of recession, with positive growth reported in the most recent quarters in Germany and France.

## 3 The job market is improving.

Non-farm payrolls fell by just 247,000 in June, while the unemployment rate eased from 9.5% to 9.4%. The rate of decline in payrolls has been improving since January, when payrolls declined by 741,000. Employment has been a lagging indicator of the economy, improving at the end of or well after every recession in the postwar period.

## 4 The Federal Reserve's efforts to stabilize the financial system worked.

The massive efforts to slash interest rates and provide trillions in funds to the financial system have succeeded in restoring conditions in the money and corporate credit markets. Corporate America has taken advantage of attractive rates to refinance old debt and fund new acquisitions. Companies issued more than \$800 billion in new bonds during the first seven months of 2009 – nearly a third more than a year earlier. In the money markets, the three-month London interbank offered rate is down to 0.43%, less than one-tenth of where this short-term benchmark stood at the worst of the credit crisis last October.

## 5 Bank lending is increasing.

Banks' profitability and capitalization have improved, and banks have started lending again. According to the Fed's recent periodic survey of banks, about 30% said, on net, they tightened lending to businesses in May, June and July, but that's down from roughly 40% in April's survey. The percentage of banks that tightened standards on commercial real estate loans dropped 20 percentage points to 45%. For residential real estate, the percentage fell to 20% from a peak of about 75% a year ago. Most banks expected lending standards across all loans would remain tighter than their average levels over the past decade until at least the second half of 2010. However, the improvement in bank lending should be enough to support economic recovery.

## 6 Expectations for 2010 economic growth continue to improve.

- In a recent *Wall Street Journal* survey, 80% of economists said they believe the recession either has ended or will end by September. In addition, economists continue to upgrade expectations for growth in the rest of 2009 and beyond.
- The top 50 U.S. economists<sup>2</sup> expect the economy to grow 2.2% in the third quarter, after falling just 1% in the second quarter.
- Economists in August lifted their projection for third-quarter growth by 1.2 percentage points over July's estimate to 2.2%, according to the median of 55 forecasts in a Bloomberg News survey. That is the biggest such boost in surveys dating from May 2003. Forecasts for 2010 were raised to 2.3% from 2.1%.
- The International Monetary Fund said in a recently revised forecast that the world economy will expand 2.5% in 2010, compared with its April projection of 1.9%.

## 7 Housing has bottomed.

Sales of existing U.S. homes jumped more than expected in July to the highest level in almost two years, signaling the worst of the housing recession may have passed. Purchases climbed 7.2% to a 5.24 million annual rate, the most since August 2007, the National Association of Realtors said recently. The gain was the biggest since records began in 1999. The S&P/Case-Shiller home price index advanced 2.9% in the second quarter from the previous three months, the first increase since 2006 and the biggest in almost four years. Foreclosure-driven declines in prices, government credits for first-time buyers and near-record-low borrowing costs are expected to continue stoking demand.

## 8 Manufacturing is on the rebound.

The Fed said industrial production rose 0.5% in July, the first increase in nine months. European industrial orders increased 3.1% from May, the biggest gain in 19 months, according to the European Union's statistics office. For the first time since January 2008, an index based on a survey of U.S. purchasing managers crossed a threshold indicating factory output grew. Manufacturing activity in China, France and Australia, among other countries, also expanded in August, separate surveys showed. The pace of contraction in Germany and some other nations slowed markedly.

### Why Does It Take So Long to Call Recessions "Officially Over"?

The official "scorekeeper" of recessions is the National Bureau of Economic Research (NBER), a private organization in Cambridge, Mass. These folks aren't terribly interested in forecasting turns in the economy. Instead, they focus on making sure their recession start and end dates are absolutely accurate and not subject to future revisions. Robert Hall, who heads the NBER's Business Cycle Dating Committee, recently said it is "more important" this time around for the group to adhere to the principle of not calling an end to the recession until after economic growth has surpassed its previous peak, "which could take 18 months or more to determine." The group took until July 2003, 20 months after the fact and well after stock prices had begun to recover, to declare the last recession had ended.

### Don't Bet Against History

Historically, the stock market has performed well once recessions end. The chart below shows the performance of the S&P 500 six and 12 months after postwar recessions ended. While history is not always an accurate guide to the future, it does suggest that investors who are out of the market are betting against a lot of history.

**S&P 500 Performance after Postwar Recessions**

Recession End Dates	% Change 6 Months Later	% Change 12 Months Later
10/31/1949	10.97%	19.57%
5/25/1954	18.63	29.98
4/30/1958	17.77	37.12
2/28/1961	7.86	7.51
11/30/1970	15.06	4.49
3/31/1975	6.57	30.63
7/31/1980	1.28	1.82
11/30/1982	15.46	22.18
3/28/1991	3.55	12.14
11/30/2001	-1.66	-10.04
7/31/2009 (est.)	TBD	TBD
<b>Average</b>	<b>9.55%</b>	<b>15.54%</b>

Source: Ned Davis Research. Daily data starting in 1947. Six months measured by 126 market days; 12 months measured by 252 market days.

### You Can't Recover If You're Not Invested

There are always risks to the outlook. The recovery could be uneven, or something unforeseen might derail the progress we've made. The stock market could correct at any time for any reason. But these things are unpredictable. Our advice remains the same: Don't base your investment decisions on predictions; base them on investment principles. Focus on the things you can control: the quality of the investments you own and the diversification of your portfolio. Maintain a long-term perspective.

It looks as though the economy is improving, but that doesn't mean you should throw caution to the wind. Instead, sit down with your Edward Jones financial advisor and talk about ways you can take advantage of the improving climate while still managing risk.

And remember, you can't recover if you're not invested.

1 The OECD, located in Paris, spells "organisation" as it's listed.

2 Latest Blue Chip Economic Indicators survey

Information in this report is as of 9/2/09.

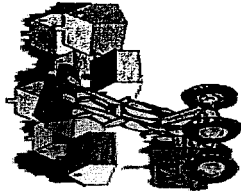
Alan F. Skrainka, CFA  
Chief Market Strategist

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**Edward Jones**  
MAKING SENSE OF INVESTING

## U.S. Census Bureau

## 2003 Building Permits



Annual New Privately-Owned Residential Building  
Permits  
Pinal County, Arizona ( 021)

2003

Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
<a href="#">Browse</a>	Single Family	6,516	6,516	745,654,654	6,516	6,516	745,654,654
<a href="#">Browse</a>	Two Family	26	52	3,505,196	26	52	3,505,196
<a href="#">Browse</a>	Three and Four Family	23	90	3,493,721	23	90	3,493,721
<a href="#">Browse</a>	Five or More Family	21	245	16,449,773	21	245	16,449,773
<a href="#">Browse</a>	Total	6,586	6,903	769,103,344	6,586	6,903	769,103,344

[N/A = Reported data not available for the time period]

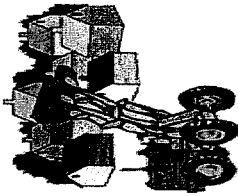
Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

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# U.S. Census Bureau

## 2004 Building Permits



Annual New Privately-Owned Residential Building  
Permits  
Pinal County, Arizona ( 021)

2004

Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
<a href="#">Browse</a>	Single Family	10,041	10,041	1,224,011,137	10,020	10,020	1,221,528,608
<a href="#">Browse</a>	Two Family	39	78	5,503,011	34	68	4,749,471
<a href="#">Browse</a>	Three and Four Family	50	194	12,999,364	50	194	12,999,364
<a href="#">Browse</a>	Five or More Family	9	54	2,848,049	9	54	2,848,049
<a href="#">Browse</a>	Total	10,139	10,367	1,245,361,561	10,113	10,336	1,242,125,492

[N/A = Reported data not available for the time period]

Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

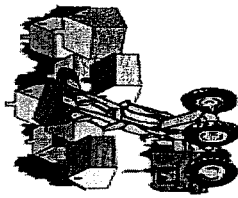
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## U.S. Census Bureau

## 2005 Building Permits



Annual New Privately-Owned Residential Building  
Permits  
Pinal County, Arizona ( 021)

2005

Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
<a href="#">Browse</a>	Single Family	11,586	11,586	1,462,499,014	11,371	11,371	1,437,548,073
<a href="#">Browse</a>	Two Family	20	40	2,714,607	8	16	1,095,000
<a href="#">Browse</a>	Three and Four Family	40	138	10,464,851	33	112	8,782,034
<a href="#">Browse</a>	Five or More Family	3	30	1,689,547	1	5	83,000
<a href="#">Browse</a>	Total	11,649	11,794	1,477,368,019	11,413	11,504	1,447,508,107

[N/A = Reported data not available for the time period]

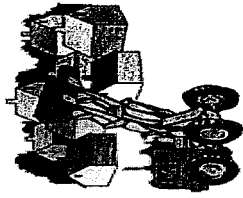
Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

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## U.S. Census Bureau

## 2006 Building Permits



Annual New Privately-Owned Residential Building  
Permits  
Pinal County, Arizona ( 021)

2006

Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
<a href="#">Browse</a>	Single Family	8,470	8,470	1,110,584,637	7,660	7,660	999,219,293
<a href="#">Browse</a>	Two Family	6	12	940,287	6	12	940,287
<a href="#">Browse</a>	Three and Four Family	9	29	1,433,148	3	11	520,164
<a href="#">Browse</a>	Five or More Family	2	41	2,916,615	1	36	2,595,306
<a href="#">Browse</a>	Total	8,487	8,552	1,115,874,687	7,670	7,719	1,003,275,050

[N/A = Reported data not available for the time period]

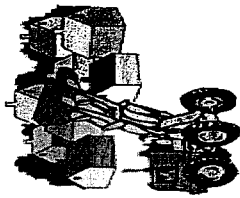
Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

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# U.S. Census Bureau

## 2007 Building Permits



Annual New Privately-Owned Residential Building  
Permits  
Pinal County, Arizona ( 021)

2007

Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	6,221	6,221	772,573,693	6,065	6,065	754,921,701
Browse	Two Family	6	12	833,450	3	6	439,982
Browse	Three and Four Family	10	40	2,871,419	7	28	2,146,247
Browse	Five or More Family	6	30	2,162,754	0	0	0
Browse	Total	6,243	6,303	778,441,316	6,075	6,099	757,507,930

[N/A = Reported data not available for the time period]

Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

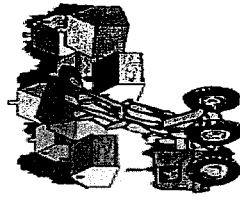
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# U.S. Census Bureau

## 2008 Building Permits



### Annual New Privately-Owned Residential Building Permits Pinal County, Arizona ( 021)

2008

Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
<a href="#">Browse</a>	Single Family	3,014	3,014	370,179,921	3,014	3,014	370,179,921
<a href="#">Browse</a>	Two Family	1	2	194,441	1	2	194,441
<a href="#">Browse</a>	Three and Four Family	1	4	239,000	1	4	239,000
<a href="#">Browse</a>	Five or More Family	0	0	0	0	0	0
<a href="#">Browse</a>	Total	3,016	3,020	370,613,362	3,016	3,020	370,613,362

[N/A = Reported data not available for the time period]

Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

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# 2009 Building Permits



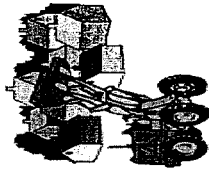
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*[N/A = Reported data not available for the time period]*  
Source: U.S. Bureau of the Census

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## U.S. Census Bureau

## 2008 Building Permits



Monthly New Privately-Owned Residential Building Permits  
Pinal County, Arizona ( 021)

August 2008

		Current Month				Cumulative Year to Date					
Item		Estimates with Imputation		Reported only		Estimates with Imputation		Reported only		Construction cost	
		Buildings	Units	Buildings	Units	Buildings	Units	Buildings	Units		
<input type="button" value="Browse"/>	Single Family	205	205	192	192	2,502	2,502	2,390	2,390	293,975,034	
<input type="button" value="Browse"/>	Two Family	0	0	0	0	2	4	1	2	194,441	
<input type="button" value="Browse"/>	Three and Four Family	0	0	0	0	2	7	1	4	239,000	
<input type="button" value="Browse"/>	Five or More Family	1	5	0	0	5	25	0	0	0	
<input type="button" value="Browse"/>	Total	206	210	192	192	2,511	2,538	2,392	2,396	294,408,475	

[N/A = Reported data not available for the time period]

Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

# 2007 Building Permits



Go!

[N/A = Reported data not available for the time period]

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# 2006 Building Permits



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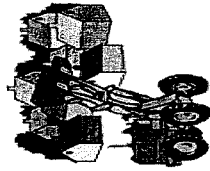
[N/A = Reported data not available for the time period]  
Source: U.S. Bureau of the Census

Click this

<http://censtats.census.gov/cgi-bin/bldgprmt/bldgdisp.pl>

## U.S. Census Bureau

## 2005 Building Permits



Monthly New Privately-Owned Residential Building Permits  
Pinal County, Arizona ( 021)

August 2005 Go

Item	Current Month						Cumulative Year to Date					
	Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse Single Family	871	871	109,778,975	759	759	96,206,016	8,237	8,237	1,019,716,092	7,933	7,933	983,013,555
Browse Two Family	1	2	150,708	0	0	0	14	28	1,962,338	8	16	1,095,000
Browse Three and Four Family	5	17	1,120,262	3	9	532,436	36	124	9,298,620	32	109	8,196,446
Browse Five or More Family	1	5	263,708	0	0	0	3	30	1,870,255	0	0	0
Browse Total	878	895	111,313,653	762	768	96,738,452	8,290	8,419	1,032,847,305	7,973	8,058	992,305,001

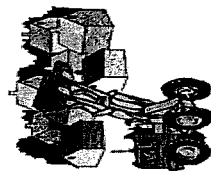
[N/A = Reported data not available for the time period]

Source: U.S. Bureau of the Census

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# 2004 Building Permits



**Monthly New Privately-Owned Residential Building Permits  
Pinal County, Arizona ( 021)**

August 2004 Go!

		Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
	Item	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
<a href="#">Browse</a>	Single Family	713	713	88,048,209	629	629	78,173,643	6,490	6,490	785,990,261	6,315	6,315	765,499,145
<a href="#">Browse</a>	Two Family	2	4	293,708	1	2	143,000	31	62	4,396,445	29	58	4,131,939
<a href="#">Browse</a>	Three and Four Family	3	12	705,000	3	12	705,000	23	87	5,499,845	23	87	5,499,845
<a href="#">Browse</a>	Five or More Family	1	19	1,275,697	0	0	0	3	39	2,618,536	0	0	0
<a href="#">Browse</a>	Total	719	748	90,322,614	633	643	79,021,643	6,547	6,678	798,505,087	6,367	6,460	775,130,929

*[N/A = Reported data not available for the time period]*

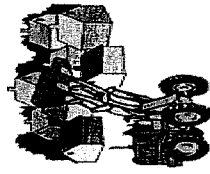
Source: U.S. Bureau of the Census

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## U.S. Census Bureau

## 2003 Building Permits



Monthly New Privately-Owned Residential Building Permits  
Pinal County, Arizona ( 021)

August 2003

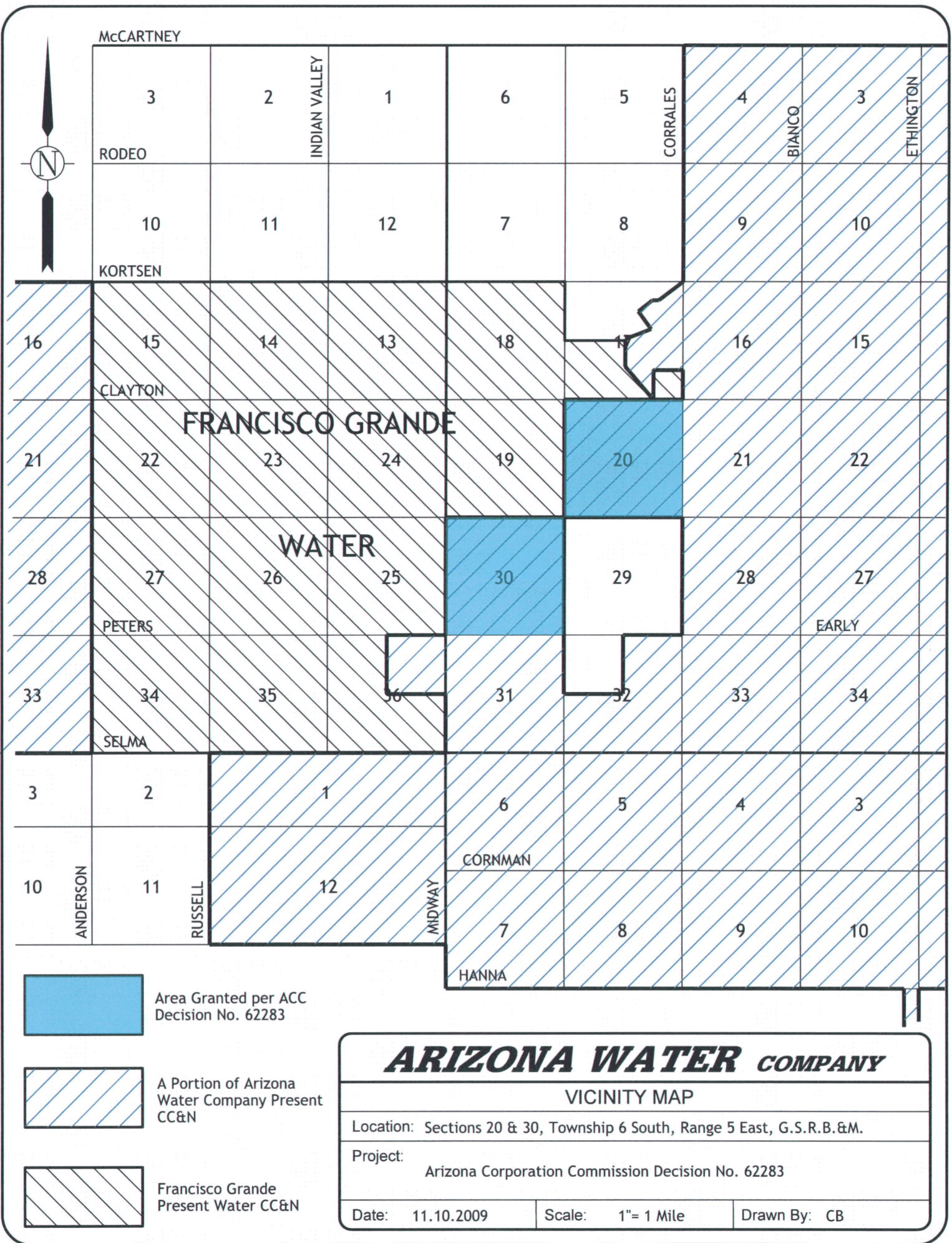
		Current Month						Cumulative Year to Date					
Item		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
<input type="button" value="Browse"/>	Single Family	648	648	76,049,504	592	592	69,562,801	4,384	4,384	497,863,192	4,105	4,105	465,980,220
<input type="button" value="Browse"/>	Two Family	2	4	204,000	2	4	204,000	17	34	2,275,583	17	34	2,275,583
<input type="button" value="Browse"/>	Three and Four Family	0	0	0	0	0	0	13	52	1,643,144	13	52	1,643,144
<input type="button" value="Browse"/>	Five or More Family	0	0	0	0	0	0	1	20	945,829	0	0	0
<input type="button" value="Browse"/>	Total	650	652	76,253,504	594	596	69,766,801	4,415	4,490	502,727,748	4,135	4,191	469,898,947

[N/A = Reported data not available for the time period]

Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas

# ATTACHMENT 7



ATTACHMENT 8

Iota Violet LLC  
200 AM Trust Bank Center  
1801 E. 9<sup>th</sup> Street  
Cleveland, OH 44114

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November 13, 2009

Arizona Water Company  
Attn: Robert W. Geake  
3805 N. Black Canyon Highway  
Phoenix, AZ 85015

Dear Mr. Geake:

Iota Violet LLC is following up with you regarding Pinal County Assessor's Parcel Nos. 503-26-024A, 024D, 025A and 025D which Iota Violet LLC. Iota Violet still needs and desires to receive water service from Arizona Water Company to serve these parcels. Our current plans include development within twenty-four months. If market conditions improve, however, we hope to shorten this timeframe. If you have any questions, please feel free to contact us.

Sincerely,

IOTA VIOLET LLC

BY: Stephen Lou

ITS: Operating Manager

ATTACHMENT 8

*Victor M. and Maria I. Soto*  
*1268 South Remington Circle*  
*Chandler, Arizona 85249*

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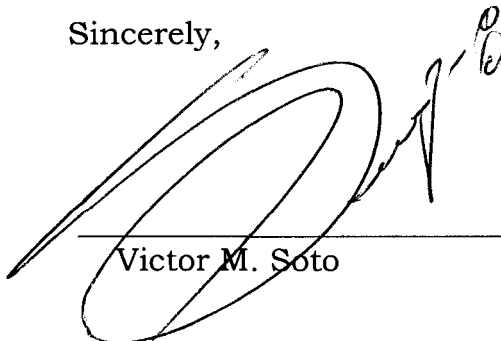
October 15, 2009

Arizona Water Company  
Attn: Robert W. Geake  
3805 N. Black Canyon Highway  
Phoenix, AZ 85015

Dear Mr. Geake:


This letter is regarding Pinal County Assessor's Parcel No. 503-01-050E, which we own. We still need and desire to receive water service from Arizona Water Company to serve this parcel. If you have any questions, please feel free to contact us.

Sincerely,



---

Victor M. Soto



---

Maria I. Soto



ATTACHMENT 8

Jesus A. and Abbie G. Ochoa  
2560 South Midway Road  
Casa Grande, Arizona 85222

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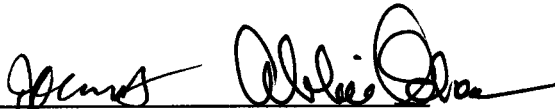
October 15, 2009

Arizona Water Company  
Attn: Robert W. Geake  
3805 N. Black Canyon Highway  
Phoenix, AZ 85015

Dear Mr. Geake:

We are following up with you regarding Pinal County Assessor's Parcel Nos. 503-01-050F and 050G, which we own. We still need and desire to receive water service from Arizona Water Company to serve these parcels. Our current plans include development within twenty-four months. If market conditions improve, however, we hope to shorten this timeframe. If you have any questions, please feel free to contact us.

Sincerely,

  
Jesus A. and Abbie G. Ochoa

ITS: \_\_\_\_\_

